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ADDRESSES AND ORIGINAL ARTICLES

PHARMACOLOGICAL ASPECT OF DIGITALIS THERAPY*

By A. Fraenkel, M.D.
HEIDELBERG

Digitalis was being used as a therapeutic agent long before the time of Withering [1] but the specific indications for its application in disease had not up to then been properly recognised. And Withering's conception of its cardiac action was by no means immediately accepted. Indeed, almost a hundred years went by before it could be said that the majority of physicians, both on the continent and in England, were making use of this conception in the practice of their profession.

Belief in the essential correctness of Withering's view arose not from the publication of a new edition of his classical monograph, nor from its translation into French and German. It sprang rather from the experimental work of clinicians who at that time were beginning to take an interest in physiology, and from whose investigations a new branch of medical science was being initiated: pharmacology. Indeed, pharmacology, in its interest in the isolation of active principles and in the investigation of the mechanism of action of old-standing remedies, has always given a privileged position to digitalis; and in spite, or rather because, of this historical development, clinical medicine has accepted the results of pharmacological investigations in so far as the mode of action of this drug is concerned. When, however, we look for the close application of this knowledge in therapeutics, we find clinical medicine still adhering strongly to traditional methods in the use of digitalis. This is especially so with general practitioners who feel disinclined to deal with experimental results which have accumulated during a long period of time, and, with the knowledge so gained, to proceed towards a rational use of digitalis in medicine.

Nevertheless, it should be possible to free the methods of use of digitalis from empirical tradition, and to ensure the same degree of accuracy in administering digitalis to patients as is demanded in a pharmacological experiment on the lower animals. In trying to do this we have of necessity to dispense with the customary galenical preparations and their many substitutes, and in addition to change the usual route of administration.

Route of Administration

Numerous experiments, originating in clinical experience, have shown that the effect of digitalis when given by mouth is decreased as a result of its reactions with the acid gastric juice and the intestinal alkali. Moreover, absorption is inhibited owing to the surface activity and adsorption of the drug. Consideration of these properties makes it clear that the effect produced by the drug at its specific seat of activity is both weakened and delayed after oral administration, and that the degree of this depression and delay will show large variations when different preparations of the drug are employed. Great as this loss in activity following oral administration in normal animals may be, it becomes increasingly so in patients under the pathological conditions of circulatory failure; indeed, under such conditions the loss becomes incalculable. With oral administration, even when pure substances are used, the production of quantitatively predetermined effects becomes impossible. By the rectal route these sources of error, although diminished, are not entirely removed, and the local irritative effect produced by all digitalis glucosides excludes intramuscular and subcutaneous injection as means of giving this drug. The only suitable way then, of administering this valuable remedy quantitatively to the heart, is by intravenous injection, the essential requirements for scientifically conducted experiments being the same whether these experiments are performed on animals or belong to the field of experimental therapy.

The unrestricted prohibition which even pharmacologists placed on the intravenous administration of drugs had been shaken as early as 1890 by Baccelli and Landerer, long before the introduction of strophanthin therapy, and it should have been entirely removed by the general adoption of this route in the giving of salvarsan. In spite of this, however, objections have been raised repeatedly to the application of an essentially laboratory technique to therapeutic practice. Such objections are clearly invalid in view of the fact that my pupils and I during the past 25 years have carried out tens of thousands of intravenous injections of strophanthin without any of the dreaded complications having arisen. Confirmation of such freedom from danger is being received from every side since the dosage has been chosen according to certain rules established by my co-workers and myself, and since practitioners have made themselves familiar with the technique of administration.

Specificity of Action

Apart from specificity of action, the essential conditions for intravenous administration of a drug are solubility in water and stability of the watery solution. In so far as specificity of action is concerned, all digitalis glucosides comply in their fundamental characteristics with this condition. Recent developments in the chemistry of digitalis have revealed close relationships between the different glucosides, and this "Digitalis-monotonie" [2]—to use Straub's expression—explains to some extent the similarity of their pharmacological actions. We are indebted to Cloetta,[3] Windaus,[4] Jacobs,[5] Stoll [6]—to mention but those who have made the greatest contributions in this field of chemistry—for having supplied the analytical proof of the similarity in chemical structure of the whole pharmacological group. All these glucosides can be split by hydrolysis into a sugar-free organic compound—the genin—and one or more carbohydrate molecules. The similarity in chemical constitution is confined, however, to the genins, the genin of strophanthin—strophanthidin—having the same number of carbon atoms as that of digitoxin, namely, 23; the former differing from the latter only in the possession of two hydrogen atoms more and two oxygen atoms less. Greater difference occurs, however, in the structure of the sugars with which the genins are combined. The genins of the glucosides of *Digitalis purpurea* (glucosides of the first order) are combined with two or three molecules of digitoxose, a methyl pentose which occurs only in plants, and which can be broken down by the human organism only with difficulty. On the other hand, the sugars

*A lecture delivered before the British Pharmacological Society at its meeting in Cambridge on July 5th, 1935. The observations and experiments on which the lecture is based are published more fully elsewhere.[19]

of the digitaloids (glucosides of the second order, such as strophanthin, adonis, scilla, &c.) are easily decomposed in the animal organism since they are for the most part pentoses and hexoses. The carbohydrate of K-strophanthin, for instance, is a disaccharide consisting of glucose and cymarose both of which are readily soluble in water. G-strophanthin, or ouabain, contains the methyl pentose rhamnose which is far less soluble in water.

In spite of the "monotony" of chemical constitution which the genins exhibit, and the qualitative similarity in the effects which they produce, wide differences are observed in their quantitative actions, differences which Straub ascribes to the structure of the carbohydrate component of the molecule. It was only by keeping in mind these differences that the possibility arose of choosing a compound for intravenous injection which should prove most suitable for the development of a new method of treatment. I was guided in this choice by the results of experiments on cats [7] in which were compared the degrees and duration of action of the different members of the digitalis family. Slowing of the pulse-rate being chosen as the criterion of action, the effect of glucosides of the first order was found to occur more slowly and to last longer than that of the glucosides of the second order. In the case of the latter the action both appeared and disappeared rapidly, and in contrast with what is found with digitoxin, the action could be maintained by repeated injections without there appearing any toxic effects attributable to cumulation of the drug. Cumulation, therefore, proved to be least with the digitaloids, and

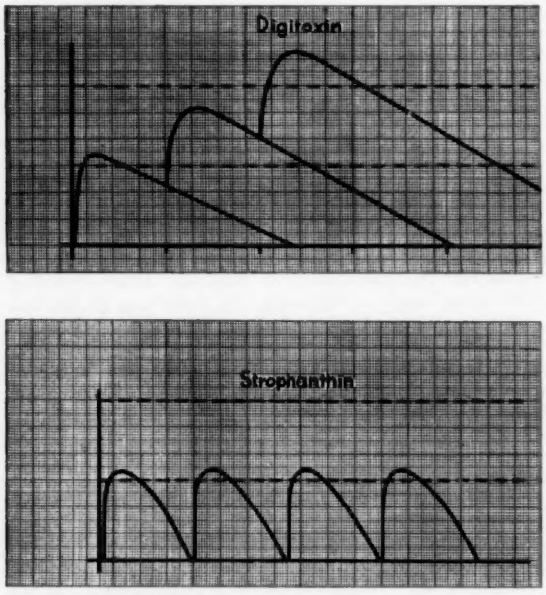

FIG. 1.—Differing cumulation of effect with digitoxin and strophanthin.

the absence of this phenomenon seemed to me an essential condition for the successful development of the intravenous method in treatment with glucosides.

The narrower choice among the digitaloids now fell on that group in which not the diuretic action, as in the case of adonis and scilla, but the cardiac action preponderated. From the two strophanthins which were available at that time, I chose K-strophanthin, since it proved to be less toxic and more easily soluble than G-strophanthin.

Fig. 1 shows in a schematic way the difference in the degrees of cumulation with digitoxin and strophanthin when repeated and individually effective doses of each drug are given at constant intervals of time. As can easily be seen the toxic range of concentration is more readily attained under these conditions with digitoxin than with strophanthin. Hatcher [8] has since repeated my experiments on cumulation, using an improved technique, and has confirmed my observations. But the scientific reason for the empirically discovered superiority of certain glucosides was only made clear by Straub's [9] fundamentally important work on the varying degree of fixation of the digitalis glucosides by the tissues, work which found extension in the recent investigations of Fromherz and Bauer [10] and of Weese and Dieckhoff [12] dealing with certain after-effects connected with cumulation. Büchner [11] pointed out the similarity between these late effects and changes in the heart muscle due to an impaired coronary circulation, and Fromherz showed that big doses of digitoxin did not, as Hatcher believed, lead to a fixation of digitoxin by the heart, lasting for several weeks, but produced irreparable and morphologically detectable injury to the heart muscle, the result, presumably, of coronary insufficiency.

Therapeutic and Toxic Cumulation

The key to the experimental differentiation between therapeutic and toxic cumulation was provided by Weese and Dieckhoff [12] when they showed on the one hand that therapeutic doses of the glucoside increased the isolated heart's capacity for work and its period of survival, and inhibited the processes of fatigue; and on the other, that toxic doses, themselves leading to morphological changes in the muscle, decreased the capacity for work and accelerated the processes of fatigue. In spite of this, however, the period of survival of such injured hearts was prolonged to the same extent as was that of hearts treated with therapeutic doses. Now the effects of these delayed injuries from digitoxin—first detected by Fromherz—had also occurred in my own experiments but I had not properly realised their significance. Even at that time, however, it struck me that the effects were to be seen only in animals treated with digitoxin, those treated with strophanthin for the same period never succumbing as the result of its administration. Subsequent experimental investigations have shown that the digitaloids, and especially the strophanthins, are fixed to the heart for so short a period that a therapeutic dose is eliminated within 24 hours, and in so giving a concrete reference for my own observations, have provided knowledge upon which the treatment of heart failure by the method outlined by myself and critically investigated by others, can be rationally based. It remains to add, as a matter of detail, that amongst the strophanthins the crystalline product from strophanthin gratus is more toxic than the amorphous compound obtained from strophanthin Kombé. This fact was clearly demonstrated by Hatcher and Eggleston,[13] who were able to show in experiments on cats that, in order to cause vomiting it was necessary to inject intravenously 49 per cent. of the minimum lethal dose if G-strophanthin was used, whereas so much as 65 per cent. was necessary in the case of K-strophanthin.

The chemical and pharmacological investigations to which I have referred, as well as the knowledge which had been obtained with respect to the muscular and vagal actions of the drug, presaged a clearer

understanding of the principles of digitalis therapy. But such was only attained when pharmacology began to use, as a basis of interpretation, the law of the heart, discovered and so clearly enunciated by Starling,[14] and when Anitschow and Trendelenburg[15] and Krayer[16] turned to the study of the therapeutic action of digitalis on the injured heart. Now about the same time as these pharmacological experiments were proceeding, a study of the circulation rate and circulating volume of blood in patients with varying degrees of functional impairment of the heart was being undertaken by clinicians and experimental pathologists, using the newer methods—gas-analysis (Barcroft, Grollmann) and physical (Broemser)—with which physiology had supplied them. A critical review of the results of such clinical investigations, carried out with different methods, admits no doubt that heart failure, as occurring after exertion in the milder degrees of functional impairment and during repose in the severer, is associated with a diminished stroke volume and a decreased output per minute, to which are linked, as secondary effects, changes in the volume of circulating blood.

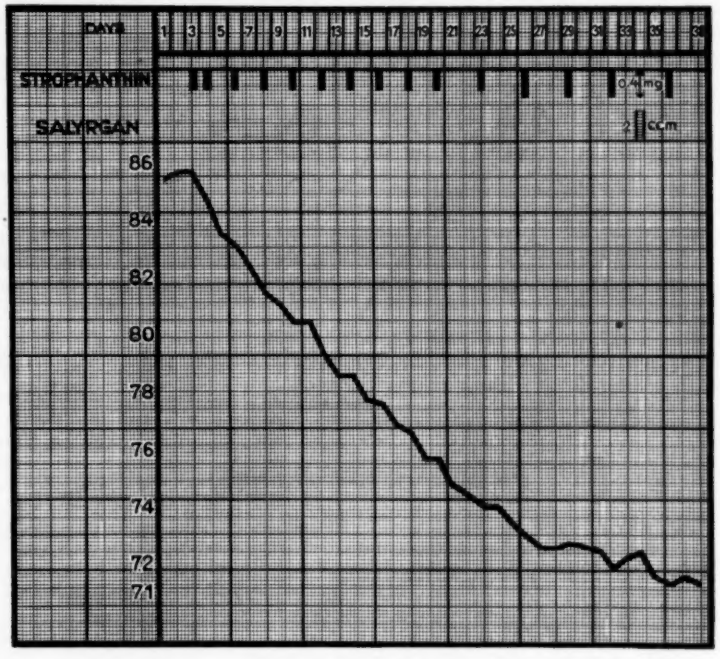

FIG. 2.—To show typical dehydration by means of strophanthin in a case of severe heart failure after treatment with digitalis by mouth had been found unsuccessful.

Digitalis and Strophanthin

The intravenous administration of strophanthin which had been adopted in the meantime, made it possible to study the effect of digitalis upon the course of these processes in man with methods as exact as those used in experiments on animals. Only patients with severe dyspnœa have to be excluded from such investigations. Now the experiments of Lauter and Baumann,[17] Kroetz,[18] Stuart and Cohn,[19] and of my pupils Herzog and Grasmann,[20] leave no room for doubt that the main effect of digitalis in heart failure is an increase in the stroke volume and a change in the distribution of blood resulting from the increased circulation rate. Such an effect can be obtained with no other drug. The absence of appreciable effect on the healthy, as on the diseased heart when functionally compensated, and its appearance after minute doses in decompensation, may perhaps be explained in part by the intramuscular development of a specific sensitivity to digitalis in this latter group. For it is known from Weese's[21] experiments that the intravenous injection of the glucoside is followed by the fixation of about 10 per cent. of the dose by the heart. If, as has been done by Clark,[22] we calculate the amount of strophanthin fixed per gramme of heart muscle, the astonishing fact is revealed that 1 g. adsorbs at most 0·002 mg. of the drug. If, moreover, we assume that a compensated heart has undergone an increase in weight by 50 per cent., and if we further take into account the fact that one-tenth of the lethal dose has a detectable effect upon the diseased heart exhibiting a high sensitivity to digitalis, we arrive at the conclusion that the concentration in which digitalis acts is of the same order as that found in the case of the hormones.

To the question whether or no there arises a specific increase in sensitivity to digitalis when the heart fails, no definite answer can as yet be given, owing to lack of clinical and especially experimental evidence. Weese points out that since the minute output of the "decompensated" heart is diminished, the possibility arises of a greater proportion of the total strophanthin injected reaching the coronary system and being fixed by the heart muscle.

The fact that disagreement in the theory of strophanthin therapy is associated with unanimity as regards the practical success of treatment with the drug, shows that much still remains to be accomplished by clinical investigation. Unfortunately we still lack methods which are easily applicable in everyday practice for the estimation of stroke volume and minute output. It is true that the physician finds a possible indication of these values in measurements of systolic, diastolic, and pulse pressures. In addition X ray photography and measurement of the venous pressure (the latter rightly emphasised by Lewis) are at his disposal for assessment of the degree of heart failure and of its therapy. Here, however, I should like to invite attention to two further methods of value in this connexion.

First, the daily measurement of body-weight excludes the possibility of neglecting the extrarenal loss of water—an error which easily occurs if only the urine output is determined—and indicates by direct means the day on which the removal of œdema fluid is completed, and so the time when the minute volume has in all probability reached its optimum. Exact observation of this kind enables us to avoid overdosage and at the same time, by gradation of the dose within 0·1 mg., to control accurately the rate of fluid removal, and so to delimit precisely the period allowed for complete elimination of the retained water; a realisation of the therapeutic ideal of obtaining optimal effects from the smallest doses. Fig. 2 illustrates this in the case of a patient who showed no improvement from treatment with digitalis by mouth.

After a preliminary observation for two days, treatment with strophanthin was begun, and during the period of treatment a decrease in body-weight from 86 kg. to 71 kg. occurred. This effect was obtained by 14 injections of K-strophanthin, the initial dose being 0·3 mg. and thereafter doses of 0·4 mg. were given. A total of 5·2 mg. was given in 33 days. On an average, therefore, the daily dose of strophanthin was 0·15 mg. and the amount of fluid eliminated was 0·5 kg. per day. Such is a characteristic case of heart failure therapy with intravenous

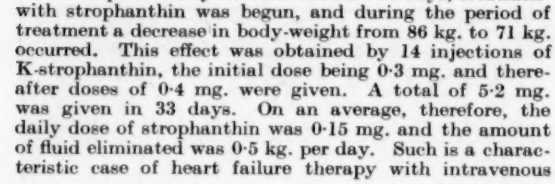

FIG. 3.—Grouping of the cases shown in the Table according to the mean rate of administration of strophanthin and the mean rate of loss of water as indicated by the fall in body-weight. Each case which died is indicated by a ring.

injection of strophanthin, the removal of œdema fluid and the course of recompensation being completely under control. At the end of treatment with strophanthin an injection of salyrgan was given, and this had no influence on the excretion of water. The giving of a provocative dose of salyrgan in such cases indicates whether or no latent œdema exists, and so supplies information of great importance in their after-treatment.

Since analogous conditions have not as yet been investigated in animals, we have already overstepped the border of experimental pharmacology. Indeed, we are immersed in the pharmacology of man immediately we ask for information from a patient as to the onset of the drug's action. And this brings us to the second means of gaining an insight into the functional state of the heart. In illness which, in the light of subsequent treatment, is shown to respond to digitalis, almost every patient, irrespective of his position in life, feels and comments upon a favourable reaction to the first injection, provided the dose which has been chosen is not too small. The patient uses the word "leicht"—linguistically similar and conceptually identical in both English and German—and he expresses in this way a feeling of happiness for the relief he has found. This "subjective indicator" either appears once only, or it may be met with after subsequent injections. Its disappearance is characteristic of the completion or approach of compensation; its reappearance signifies new failure, threatened or already present. The cause of this "subjective indicator" has not yet been ascertained; all that seems to be certain is that it precedes the demonstrable increase in the minute-volume. The presumption is that it is the expression of the first return to normal in the tension of CO_2 and O_2 in the respiratory centre, resulting rapidly and indirectly from the increased circulation rate. This self-observation of the patient receives its full importance from the fact that, unlike with morphine, therapy with strophanthin is not complicated by the phenomenon of tolerance. The necessity of increasing the dose or reducing the intervals between successive injections, which may occur in the case of intravenous strophanthin therapy, always depends upon either an anatomical or a functional deterioration in the heart as a result of progressive disease.

Principles of Strophanthin Therapy

The essence and limitations of therapy with intravenous injections of strophanthin can be formulated in the following way:—

1. There is no degree and no phase of cardiac insufficiency from the beginning of the disease—often difficult to gauge—to the stage of extreme abnormality in the distribution of blood along with its accompaniments, which does not respond to the intravenous administration of strophanthin. Only the compensated heart on the one hand or the dying heart on the other not yet responds or no longer responds to this treatment. Indeed, it is possible to draw conclusions of the greatest value for diagnostic and prognostic purposes from the absence of response as well as from its presence, and in the latter case from the amount of drug and the period found necessary for functional recovery to occur.

This can be seen from the collection of a group of cases characterised especially by large hearts with myocarditis—transverse diameter from 19 to 23 cm.—and by very marked œdema. In some of these cases hypertonia, in some irregularities in rhythm were present;

TABLE *showing the relation between the amount of strophanthin used, the loss of water in kg. body-weight, and the duration of treatment in days, in a group of patients in each of which the transverse diameter of the heart was greater than* 19 *cm.*

No.	Diagnosis.	Result.	Water lost kg. Mg. strophanthin × days.
1	Chronic myocarditis	—	0·018
2	,, ,, chronic nephritis	Died.	0·022
3	,, ,, hypertonia	Died.	0·034
4	,, ,,	Died.	0·038
5	,, ,, chronic nephritis	Died.	0·044
6	,, ,,	Died.	0·046
7	Aortitis, aortic regurgitation, hypertonia	Died.	0·049
8	Chronic myocarditis	Died.	0·052
9	,, ,,	—	0·055
10	,, ,, hypertonia	Died.	0·061
11	,, ,,	—	0·062
12	,, ,, chronic nephritis	—	0·062
13	,, ,, hypertonia	—	0·088
14	,, ,, arterio-sclerosis	—	0·091
15	,, ,,	—	0·092
16	,, ,, hypertonia	—	0·117
17	,, ,,	—	0·132
18	,, ,, hypertonia	—	0·132
19	,, ,,	—	0·143
20	,, ,,	—	0·161
21	,, ,,	—	0·163
22	,, ,,	—	0·175
23	,, ,,	—	0·217
24	,, ,,	—	0·238
25	Mitral stenosis	—	0·281
26	Mitral regurgitation	—	0·287
27	Chronic myocarditis, hypertonia	—	0·293
28	,, ,,	—	0·312
29	,, ,, bronchitis, and emphysema	—	0·392
30	Chronic myocarditis	—	0·483
31	Ch. myoc. with fatty degeneration	—	0·459
32	Graves's disease	—	0·541
33	Mitral stenosis	—	0·713

Ch. myoc. = chronic myocarditis.

others were free from either of these complicating factors. All were treated with series of injections of strophanthin, only after treatment with digitalis by mouth had proved unsuccessful. The doses of strophanthin were so chosen that the patients lost weight to a degree not greater than 1 kg. per day (see Table and Fig. 3).

In the Table are grouped a series of cases arranged according to the value of a factor expressing the ratio

between the rate of water loss and the weight of strophanthin used. As will be seen the factor varies between 0·018 and 0·713. These cases are again shown in Fig. 3, and here the ordinate represents the mean rate of administration of the drug, the abscissa the mean rate of water loss. Those patients who needed little strophanthin and displayed a marked diuresis—represented by points to the right of the figure—lived long. Those on the other hand who received more strophanthin and yet eliminated their retained water more slowly—represented by points to the left of the figure—died within a shorter period.

(2) In strophanthin therapy it is necessary to adhere to exact dosage, and to take careful records of the effects of each and every dose, just as in experiments with animals, and even if the treatment be continued for a long time. This demand—a matter of course in the laboratory—is, in the application of most therapeutic measures, for the most part neglected. Such a procedure, being based on scientific method, raises strophanthin therapy to the level of controlled experiment, and furnishes at the same time a guarantee of its safety.

Although the clinic considers the oral administration of digitalis to be contra-indicated in certain cases of valvular defect and disordered rhythm, the systematic use of strophanthin by the intravenous route finds successful application in such cases too. The ætiological factor becomes of less importance; the decisive factor is the functional impairment of the heart with its accompaniments of venous stasis and deranged distribution of blood.

I should like at this stage to invite attention to two points which can best be illustrated by reference to individual cases. In mitral stenosis, in which treatment with digitalis by mouth is often difficult and even dangerous, it is possible to obtain an ideal therapeutic effect if the doses of strophanthin are small and are given at proper intervals of time. Moreover, it is by no means exclusively cases of heart failure with auricular fibrillation or frequent and regular pulse which respond to strophanthin administration. Complete success is met with even when the pulse is infrequent and regular. In these cases the muscular effect of strophanthin is more prominent than the vagal. These facts are illustrated in Fig. 4A, in which are charted the results of the administration of strophanthin to a patient aged 59 years with sclerosis of the coronary arteries; before admission he suffered from attacks of angina pectoris and he also experienced symptoms of Adams-Stokes' disease. Total heart-block was present, and there were signs of cardiac insufficiency, though these were small in degree. The block persisted—40 ventricular beats per minute—after treatment (see Fig. 4B). After 15 injections each containing 0·25 mg. of strophanthin had been given, the œdema of the lungs—demonstrable by Rontgen rays—had disappeared, and 6 kg. of latent œdema fluid had been eliminated. The patient felt well, and the attacks of angina and of the Adams-Stokes syndrome subsided.

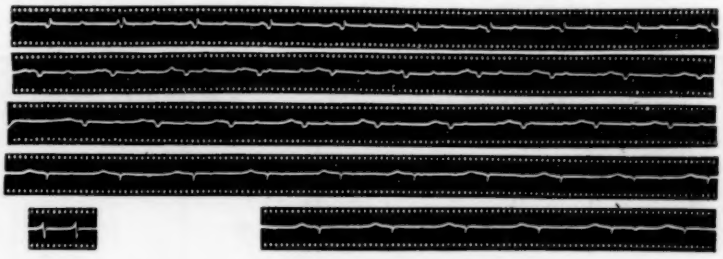

FIG. 4B.—Electrocardiogram of the patient to which Fig. 4A refers: before and after treatment with strophanthin.

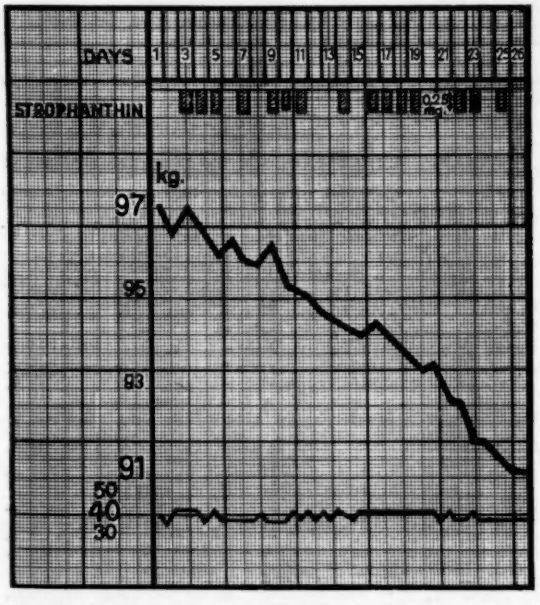

FIG. 4A.—To show the disappearance of œdema of cardiac origin in a patient with arterio-sclerosis and a pulse frequency of about 40 per minute. Complete heart-block was present (see Fig. 4B).

(3) The prognosis of cardiac insufficiency has entirely changed since the possibility has arisen through the use of strophanthin not only of enlarging the field in which treatment with digitalis is indicated, but also of making success in the treatment of certain cases more assured. The features of this disease have been further allayed since we have had at our disposal a suitable mercurial diuretic which can be given intravenously. The heroic treatment of heart failure with calomel and digitalis by mouth, dating back to Fothergill, is now replaced by one which involves the administration of salyrgan, and so supplements the effect of strophanthin in this disease. Salyrgan acts on the tissues as well as the kidneys, and possesses the outstanding advantage that it can be given intravenously, and so in an exact dosage, which when properly chosen ensures freedom from danger. The appropriate combination of both remedies, not simultaneously or on the same day even, but one after the other on different days, makes possible the removal of œdema of the severest degree as well as that of very long standing. Drainage of the legs, so irksome to patients, is avoided, and reappearance of œdema in large part prevented. Cardiac œdema is a secondary disease which can be avoided if the failing heart is treated early enough, and if, after recompensation has become established, treatment is continued for a still longer period, the duration of which must be determined in each case by circumstances. In illustration we may quote the following case.

A patient, 60 years old, with arterio-sclerosis and hypertonia, a large heart (transverse diameter 18·6 cm.) and auricular fibrillation, had shown signs of heart failure for a year. His physician treated him with digitalis, giving small doses at first and large later. No improvement was detected, but instead signs of overdose (pulsus

bigeminus) supervened. Fig. 5 shows that after a short period of observation without medication, the loss of water was initiated by salyrgan and the failure of the heart abolished by strophanthin. It may be added that we were able to avoid the appearance of pulsus bigeminus as well as other signs of toxic action, in spite of the fact that the patient received in the course of 60 days 25 injections of strophanthin of about 0·3 mg. each, amounting to 6·3 mg. of the drug. In addition a total of 16 c.cm. of salyrgan in 12 injections was given. The elimination of water resulted in a decrease of 21 kg. in body-weight, a fact which shows that the normal weight of the patient had increased by as much as 40 per cent. during the development of the failure. Notice should also be taken of the fact that the elimination of œdema fluid under the influence of the diuretic salyrgan, acting on the tissues and kidney, occurs characteristically in steps, whereas during the quantitatively controlled treatment with strophanthin this loss proceeds steadily. This can be seen especially well if Fig. 5 is compared with Fig. 2.

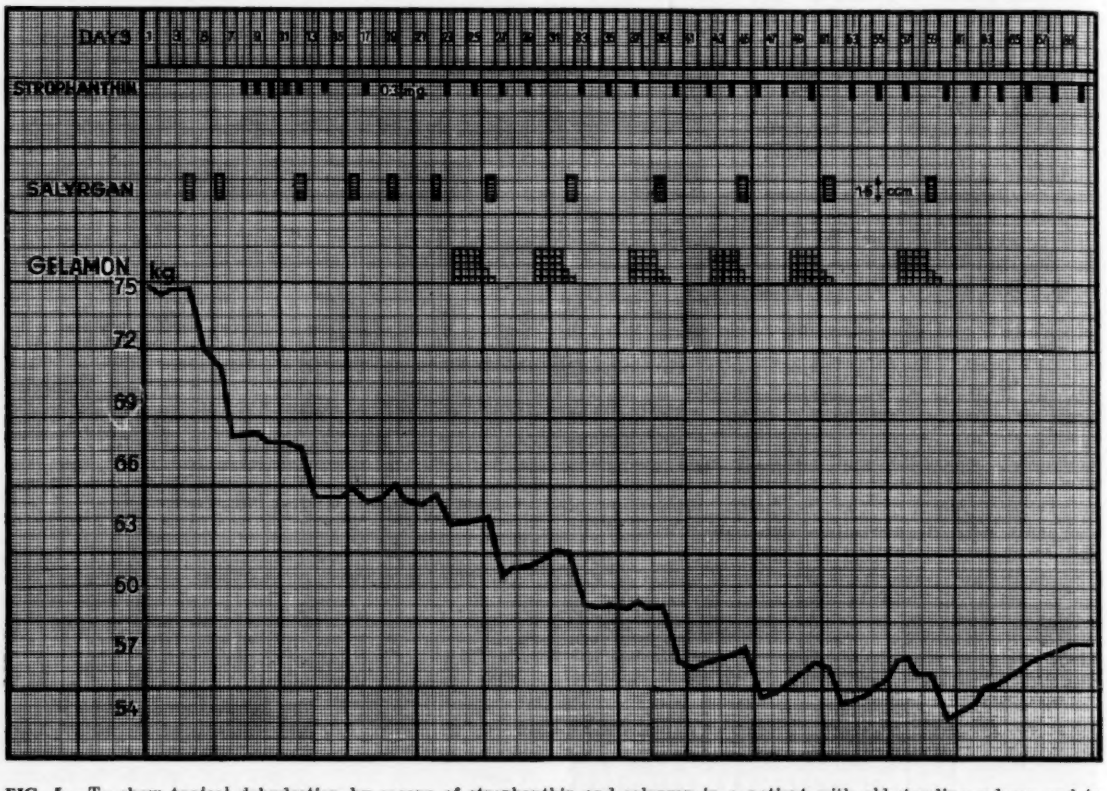

FIG. 5.—To show typical dehydration by means of strophanthin and salyrgan in a patient with old-standing œdema and in whom signs of overdose with digitalis had previously appeared.

From the first experiments with digitalis on the frog's heart to the more recent and complicated investigations on the action of digitalis on the heart and circulation of the mammal, the path has been long and tiresome. We must not be surprised, therefore, if the practical application of pharmacological research to the reduction of the suffering and to the prolongation of the lives of patients with heart disease, takes long to achieve. This attempt, however, to evolve a rational digitalis therapy from a knowledge of experimental pharmacology, and to describe the peculiar importance of the intravenous route in connexion with the glucoside which is most suitable for this mode of administration, is not to be regarded as a revolt from the customary empirical use of preparations of digitalis by mouth. By no means—Withering's therapy retains its position in the treatment of heart failure where such is of not too severe a degree or of not too long a standing.

I wish to thank the editors of "Strophanthintherapie" and the "Verhandlungen der Deutschen Gesellschaft für innere Medizin" and the publisher, Herrn Julius Springer, Berlin, for permission to reproduce the Table and Figs. 3, 4A, 4B, and 5 from papers by Dr. Herzog and myself.

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OBSTETRIC PRACTICE OF THE FUTURE*

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At the present day it is often stated that all is not well with obstetrical practice in this country; nor is it in fact perfect in any country. There are many factors involved, many openings for errors in judgment, even by the competent specialist working under the best conditions. Much greater are the difficulties and more frequent the occasions for faulty practice in the surroundings in which so many women are delivered.

Factors Favouring Institutional Midwifery

I propose to examine two considerations, which in our evolving civilisation have come to the front, and, I believe, will prove to be fundamental factors in directing the practice of obstetrics in the future. These are (1) the increasing demand by women themselves for the relief of pain at childbirth, and (2) the desirability of lessening so far as possible the traumata of parturition both maternal and fœtal. The most satisfactory and successful means of providing these safeguards will, in my opinion, require and lead to the provision of more and more lying-in beds in hospitals, voluntary, municipal, and private. The midwife and the obstetrician of the future, working in coöperation, will, it appears to me, conduct more and more and finally all deliveries, in specially equipped institutions. However great may be the supposed advantages of domiciliary midwifery in present-day practice, they will be supplanted, I believe, by the benefits to all concerned which will follow the widest possible extension of institutional midwifery.

DEMAND FOR RELIEF OF PAIN IN CHILDBIRTH

All must agree that an increasing number of women desire the relief of pain in childbirth. It is not only fair and humane to recognise this demand, but sound in principle to accede to it. By preventing or dispelling severe pain in childbirth, both physical and mental shock with their harmful consequences, immediate and remote, are obviated. However, the successful methods so far available require constant attention by nurse or doctor, and often doctor as well as nurse, and both of these must be specially experienced in the choice and control of these pain-relieving drugs. One must also admit that the natural course of labour is often prolonged.

In domiciliary practice the achievement of really effective relief from pain demands too much of the family doctor's time, and so may easily lead to interference in the labour which may be premature and harmful, or, even if well chosen and advantageous, cannot, with due regard to immediate safety or future comfort, be carried out in the ordinary domestic bedroom. The necessary space, assistance, and even equipment may be, one or all, lacking.

My second consideration is, the avoidance of birth trauma.

AVOIDANCE OF BIRTH TRAUMA

I am not concerned now with the prevention of severe trauma of mother or fœtus by the employment of induction of labour, or of Cæsarean section in cases of pelvic contraction or other instances of marked disproportion between fœtus and pelvis. It is already generally recognised that such procedures are most safely practised in maternity hospitals. I have in mind the avoidance of less severe but permanent damage to the pelvic floor and perineal body, and at the same time the prevention of harmful compression of the fœtal head by prolonged pressure on the resistant perineum. For a number of years I have been more and more impressed by the advantages to mother and infant of the operation of episiotomy. The increasing use of analgesics and anæsthetics has no doubt helped to bring this about. When they are used the natural forces in labour are often hampered, as I have already stated, and natural expulsion of the fœtus is liable to be dangerously prolonged or even completely frustrated.

The Advantages of Episiotomy

I am therefore in full agreement with Prof. Leyland Robinson [1] when he states, in a recent paper on the treatment of genital prolapse, that he is "convinced that prolonged pressure reduces the nutrition and sometimes destroys the tone of the supporting pelvic floor and perineal muscles, and that excessive conservation may be responsible for the development of prolapse. A well-judged episiotomy designed to cut short this harmful period of waiting and dangerous pressure, is," in his opinion, "a prophylactic measure of real value and one that ought to be employed more frequently."

Prof. Robert Goodall [2] of Montreal has also written recently, and very convincingly, in favour of episiotomy followed by immediate and careful suture. After ten years' experience of the conservative policy of non-interference, he has come during the succeeding ten years to practise prophylactic intervention near the end of the second stage of labour with definite objects in view: (1) reduction in the amount of damage to the abdominal wall; (2) minimal damage to the supports of the uterus, bladder, and rectum; (3) a completely restored pelvic floor; (4) great reduction in the number of stillbirths, and I think one can fairly add a probable lessening of mental morbidity in childhood and adult life.

In regard to this last consideration, it is significant that Dr. Leonard Findlay,[3] who has devoted much time to the study of the causation of mental deficiency, does not think that it is to any large extent hereditary. On the other hand he believes that in the larger proportion of cases it is due to difficult birth, and he draws attention to the special liability of the first-born to this defect. This view is held by other authorities: Dr. R. D. Clarkson,[4] of the Royal Scottish National Institution for Mental Defectives at Larbert, considers it "cruel and inaccurate to maintain that mental deficiency is hereditary": "Very few of the parents of the patients in the Larbert Institution are certified defectives." "John Thomson, Leonard Findlay, and Charles McNeil have all," he states, "proved that heredity plays only a small part in the ætiology of mental deficiency," and Dr. Clarkson "is quite certain that a very large proportion of the cases are caused by injury to the brain at birth." Excessive moulding of the head from prolonged pressure on it by a resistant pelvic floor must occur to the experienced obstetrician as one likely cause of this calamity.

Central episiotomy comprises a precise and predetermined division of the fascial septa separating the perineal muscles, and even of the vagino-rectal sheet of fascia which runs from belly to belly of the

* The second part of a paper entitled Men-Midwives Past and Future, which was read before the Bristol Medico-Chirurgical Society on March 13th, 1935. The first, historical, part was published in the *Bristol Medico-Chirurgical Journal*, 1935, lii., 83.

levatores ani. This is in place of bruised and crushed lacerations of the fascia and muscles—generally open and obvious injuries, but not seldom subcutaneous and therefore invisible. When the episiotomy wound has been sutured in layers, with the precision which adequate assistance and good light make possible in a clean-cut wound, the woman can return to her domestic or other duties, unhampered by the constant discomfort produced by sagging pelvic floor and viscera. Junior students watching the operation of repair are surprised to see the thickness of the perineal muscles, which ranges from one-third to half an inch, instead of the "slender fasciculi" which text-book anatomists have taught them to expect. Surely it is better for the woman to have such a wound repaired in this thorough way, than to have to submit to the formal plastic operation, expensive in both time and cost after years of increasing discomfort.

If we recall the preparations, precautions, and personnel which are found necessary to ensure success in these belated plastic repairs, and contrast them with the disadvantageous circumstances in which the recently torn perineum and vagina are more or less ineffectively stitched, it seems clear that this wide gap between mismanagement and efficiency must be bridged. More than half the beds in my gynæcological wards are in constant use by patients recovering from the plastic repair of old obstetrical injuries; more than half the time I spend in the operating theatre is occupied in repairing the damage which parturition has inflicted on the genital passage. I will grant that perhaps a fourth of these operations are concerned with injuries to the cervix and upper vagina especially, which have often followed premature and injudicious interference in parturition. These are often enough no doubt due more or less directly to the difficulties of time and place which surround ordinary domiciliary midwifery practice. However, the majority of these repairs involve the perineum and pelvic floor. The rectocele resulting from the injuries inflicted during childbirth may cause daily discomfort and produce much mental distress and even neurasthenia. This damage should have been prevented by adequate management in the hour of labour. Such effective care, I submit, can only be guaranteed in a properly equipped maternity hospital—not necessarily a large one—with all the facilities of equipment and personnel which are rarely if ever available in the woman's own home.

It is also my experience that episiotomy at the right moment, is often followed by natural unaided expulsion of the fœtus. The right moment is in the latter part of the second stage, as soon as it is evident that the perineal body is holding back the fœtal head. The last and probably most harmful degree of moulding, which might have resulted from the most careful extraction of the head by means of forceps, may thus be avoided.

It is of interest to contrast, by gauging with finger and thumb, the thickness and tonicity of the perineal body in women after a properly repaired episiotomy, and in other women after a natural delivery in which there had been no surface tear, but subcutaneous laceration followed by retraction of the muscle. Such laceration leaves a thin and toneless perineum and is often followed by the formation of a rectocele and a lack of support to the lower part of the anterior vaginal wall on which rests the urethra. The perineum restored after episiotomy will often, of course, require the same care at a subsequent labour, a possible disadvantage in the old days of large families and frequent childbearing. The present-day smaller and wisely spaced family does not focus attention on this consequence. On the other hand, the modern mother has probably a higher standard of comfort and prefers to feel as sound and "comfortable below" as she did before her child was born.

Extension of Institutional Practice

I have given the two main considerations which lead me to advocate an extension of institutional midwifery practice. Many others could be advanced, not the least impressive being contained in the following extract from a recent letter [5] by a young general practitioner, in condemnation of the handywoman. He says:—

> "Not infrequently I have had a filthy woman of abysmal ignorance and ineptitude as helper, a cottage room bunged up with old furniture, clothes, bric-à-brac, no hot water, a candle to work by, and in these surroundings have had to do a difficult forceps, first giving the anæsthetic, then hastily scrubbing up and performing the operation—with one eye on the patient, one on the job, and any spare glances to keep the 'Gamp' from interfering."

Such reasons as these are already greatly influencing the general public as well as many maternity nurses and medical attendants, the result being an increasing demand for maternity in-patient treatment throughout the country.

The number of maternity beds available in municipal institutions, in voluntary hospitals, and in private nursing-homes is rapidly increasing. It is not possible to give exact figures for the whole country, but Sir George Newman in his Annual Report for 1933 recognised the increasing demand and its consequences; he gave a table showing that in the city of Manchester the proportion of the total number of births, taking place in hospitals and registered nursing-homes, has risen year by year from 10·9 per cent. in 1924 to 40·36 per cent. in 1933 (it was over 50 per cent. in 1934). He remarks that "This may fairly be regarded as representative of the present tendency in urban areas." Most of us are aware that this tendency is also evident in the smaller towns, and even in country districts the village midwife and the family practitioner find that many women will readily avail themselves of a maternity hospital as soon as one is provided in the adjacent market town. Both midwife and doctor quickly realise that such an arrangement is helpful.

Modern housing, which usually provides more but markedly smaller rooms, and the increasing difficulty in obtaining domestic assistance exert an influence in the same direction. In some places the demand for this accommodation greatly exceeds the supply.

LIMITATION OF SIZE OF INSTITUTIONS

This is not the occasion on which to consider in detail the construction of these hospitals. They would vary in size from the large urban hospital of 100 to 200 beds, adapted not only for the comfort and safety of parturient women, but also for the purposes of teaching and research, to those of 10 to 20 beds, perhaps more or less closely associated with cottage hospitals, to serve country districts.

There are reasons for holding that there should be a definite limitation in size; it is likely that those hospitals not exceeding 100 beds would give better results than those with more. Whatever the additional cost might be, it would be wiser for a large urban area to provide two or even more maternity hospitals rather than one beyond the capacity of personal control by the obstetrician in charge.

I can also picture a small lying-in hospital as an

essential part of the lay-out of a modern garden city, or of the new residential areas which are springing up so rapidly on the outskirts of all large cities; and possibly, even as a standard provision in the large residential flats which are bound to arise in the central areas of the largest cities. By such means would be avoided the great drawback of a forbidding distance between the woman's home and her lying-in bed.

No one knows better than I that many experienced obstetricians look with great disfavour and even alarm on a wide extension, such as I have outlined, of institutional as opposed to domiciliary midwifery. The increased risk of the spread of puerperal sepsis is a very real one; one has only to read the history of the subject to realise this danger.

The general surgeon has also had this problem of septic infection to face, and he has overcome it with almost complete success. With regard to child-bed infection the problem is, in my opinion, only apparently a more difficult one. As soon as the precautions that have been found necessary by the general surgeon are carried out conscientiously and in minute detail by fully trained obstetricians and midwives, so soon shall we see a marked fall in the incidence of puerperal sepsis.

However, the responsibility involved in bringing together numbers of lying-in women is a very great one—there are loopholes for failure, it is human to err, and the onset of labour cannot be postponed (as most surgical operations can) when the woman is suffering from general ill-health or some other infective condition. I have here in mind especially infections of the nasopharynx.

ONE-BED WARDS

This special possibility of infection leads me to advocate that each woman in labour, or shortly expecting labour, should be admitted to a single-bedded room of sufficient size to enable a straightforward delivery to be comfortably carried out in that room if so desired. In other words, the hospital bed accommodation should be almost if not entirely "private" and not so to only a small extent as we find in nearly all maternity hospitals—municipal as well as voluntary. This is what can be done in our private maternity homes with a complete absence of serious puerperal infection.

The idea is a very old one; in 1773 Charles White [7] of Manchester, who wrote so wisely on the management of lying-in women, laid it down that "it would be still better if every woman was delivered in a separate ward, and was to remain there for a week or ten days till all danger of this fever was over." However, I would modify this opinion of Charles White, to which he was driven by consideration of the terrible epidemics of puerperal fever which broke out from time to time in the lying-in hospitals of his day. It would be allowable four or five days after delivery, all being well, and when greatly desired for social or financial reasons, to transfer the woman, preferably bed and all, to a small ward with not more than three or four patients.

I feel convinced that this ideal plan would not be so impracticable as it may at first sound, and it would obviously lessen some of our other difficulties, for example the shortage of accommodation, with its evil consequences, which arises when large wards are being cleaned, and also the danger of imported infection by visitors.

THE PERSONNEL REQUIRED

It must have become obvious that I expect the "man-midwife" of the future to have had a special training in obstetrics and especially in surgical obstetrics.† This will necessitate post-graduate residence in a maternity hospital, and the obtaining of a special diploma as evidence of proficiency in operative midwifery. The larger hospitals must be controlled by a resident master-obstetrician and gynæcologist. Under him will work a whole-time staff of large experience, who will be directly responsible for all major operations. They will also control and supervise the routine work of the midwives, who, in the near future, will be compelled, I am convinced, to take a much longer and more thorough course of training than is the rule at present.

In the smaller district and country hospitals, it will probably be found necessary for a family doctor, who is sufficiently interested in obstetrics to have qualified himself by special post-graduate hospital experience, to attend these patients with the coöperation of the highly trained resident midwives, aided of course by a colleague when an anæsthetic is required. In other words, before undertaking this responsible work he will have to have gained experience and skill, after graduation, by a long period of residence in a maternity hospital, and not, as has been too long the case, by striving to overcome the difficulties of domiciliary practice, often, I readily grant, with surprising success, but sometimes at the expense of the parturient woman or her child.

Would this revolutionary change be such a grave hardship as some imagine? I doubt it. Many of my doctor friends have told me of their dislike for midwifery, with its anxieties and exactions; that they undertake as little as possible, and that only in order to benefit their general practice.

Surely such an attitude of mind is a very grave handicap. I have long realised this. My own views could hardly be better expressed than in the following sentences which I have extracted from a recent letter—again from a general practitioner.[6] He says:

"Probably most general practitioners would admit that they consider midwifery the most irksome of their many duties. Either it interferes with the ordinary run of work or it deprives them of much-needed hours of sleep. . . ."

He suggests that:—

"The medical profession should organise its own midwifery on the following lines. Let the country be divided up into districts. In each district the general practitioners would agree to hand over all their midwifery to someone who wishes to specialise in this work and in gynæcology, and who, in turn, would guarantee to practise solely as a gynæcological surgeon and specialist in midwifery. . . . The general practitioner would be relieved of much night work without losing his family practice."

In addition, he points out, "neighbouring districts could combine to equip up-to-date maternity and gynæcological hospitals." The author of this letter and I, looking at the problem from different angles, would seem to have come to very similar conclusions. I feel sure he would agree with me that this great change will have to be gradually evolved.

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† One aspect of the problem discussed in the historical portion of this paper has been abolished by the advent in recent years of highly trained women specialists, who have earned the confidence of both the general public and their male colleagues

CYCLOPROPANE ANÆSTHESIA

A REPORT BASED ON 250 CASES

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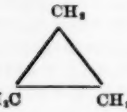
BEING THE ANÆSTHETIC STAFF OF THE CANCER HOSPITAL, LONDON

OUR knowledge of the chemistry and physical properties of cyclopropane has been gained chiefly from America; it is to Waters and Schmidt of Wisconsin that we are indebted for its introduction and establishment as an anæsthetic agent.

First prepared by the German chemist Freund in 1882,[1] it was not until 1929 that its anæsthetic properties were investigated by Lucas and Henderson at Toronto.[2-4] In October, 1933, a preliminary report on 447 cases of cyclopropane anæsthesia from the University of Wisconsin medical school to the Annual Congress of Anæsthetists focused the attention of anæsthetists all over the world upon the new gas.[5] It was introduced into England in December, 1933, by Dr. R. M. Muir of Cape Town, who brought a cylinder with him from America and generously consented to administer it to several cases at the Cancer Hospital.

Cyclopropane or trimethylene is an isomer of the hydrocarbon gas propylene. Its formula shows its cyclic structure. It is heavier than air (spec. gravity 1·46) and is almost insoluble in water, but very soluble in lipoids (1 c.cm. olive oil dissolves 103·5 c.cm. cyclopropane).[3]



Being an inflammable gas, it is explosive in mixtures with air or oxygen. In air the flammability limits are 3 per cent. to 8·5 per cent.; but in oxygen 2·5 per cent. to 50 per cent. (18·2 per cent. cyclopropane with 81·8 per cent. O_2 gives a maximum explosive violence). In nitrous oxide the limits are 3 per cent. to 28 per cent. Hence cyclopropane is capable of exploding as usually administered for anæsthetic purposes. Precautions must be taken, as with other inflammable anæsthetics, to eliminate sources of ignition and therefore its use with the cautery or diathermy is definitely contra-indicated.[6] It has a characteristic pungent smell not unlike that of ethylene but is not irritating when inhaled in the concentrations necessary for producing anæsthesia.

Cyclopropane can be compressed into cylinders without undergoing chemical change. It liquefies at a pressure of 75 lb. and a 100-gallon nitrous oxide cylinder will hold about 62½ imperial gallons of cyclopropane.* Such a cylinder at present costs £9 in London, but we understand that the gas manufactured in this country will cost about £6 5*s*. for a similar amount, or 2*s*. per gallon.

Cyclopropane is prepared by the reduction of trimethylene bromide with metallic zinc in alcoholic solution. The Ohio Manufacturing Company were the first to develop its manufacture and purification, and it was with gas manufactured by this company that the investigations at the University of Wisconsin were carried out; the greater proportion of the gas used for our investigation also being obtained from this source. We have lately obtained samples manufactured and presented to us by Imperial Chemical Industries Ltd. This has not quite so pungent a smell as that imported from the United States, and after tests with laboratory animals we have employed it at the Cancer Hospital. We are satisfied that it is as potent an anæsthetic agent as that obtained from America; that it is no more toxic, and that it is more pleasant to inhale.

The conclusions reported in this paper are based on an experience of 250 cyclopropane administrations carried out during the past eighteen months, of which 76 were in private practice and the remainder at the hospital.

*One ounce weight = 3½ imperial gallons of gas.

PROPERTIES

Cyclopropane is a powerful anæsthetic of the potency of chloroform but without its toxicity and without its depressing effect on the circulation. In many of our cases we have found an increase of the systolic blood pressure, and it seems remarkable that this has not been commented upon by the early investigators in America, for we have observed it and checked one another's observations repeatedly. Shortly after administration starts the patient's systolic pressure rises 10, 20, 30 or more mm. Hg; a rise of diastolic pressure follows, but as a rule of less degree. If the anæsthesia be now lightened the pressure usually begins to fall, only to rise again on addition of more cyclopropane. The higher the concentration of cyclopropane the higher the blood pressure, even when the anæsthesia reaches almost to the stage of respiratory arrest; but in cases where the pulse becomes intermittent through overdose and also in those with shock the same continuous rise does not occur. Definitely we found more capillary bleeding than with other anæsthetics.

Waters and Schmidt state that there is no alteration in the coagulation time of the blood.[7] With this our observations in 4 cases agree.

"Cyclopropane," they say, "is capable of producing narcosis when inhaled in concentration as low as 4 per cent. . . . the average concentration of cyclopropane for first plane, third stage anæsthesia (roving eyeball) was 7·4 per cent., while second plane (fixed eyeball, sufficient for a majority of abdominal operations) required an average of 13·1 per cent., and third plane, with intercostal paralysis, required an average of 23·2 per cent. . . . Fourth stage anæsthesia, or respiratory arrest, was produced with an average concentration of 42·9 per cent. When produced in the presence of high oxygen concentrations, such respiratory arrest has not been found to cause harm provided ample tidal exchange is artificially maintained."[7]

There appears to be a good margin of safety between 23 per cent. and 43 per cent., but in our opinion cyclopropane must nevertheless be considered a respiratory depressant. It is true that deep anæsthesia with consequent depression of the respirations is very easily and quickly attained, and the impression may at first be formed that the anæsthetic affects the respiratory centre more powerfully than is actually the case; but we have occasionally found patients (especially those who have received full premedication) cease breathing before muscular relaxation can be obtained.

One case was particularly instructive in this respect. The operation was a Cæsarean section on a healthy woman who was not in labour. No preliminary medication was given, and the amount of cyclopropane added to gas-and-oxygen was barely sufficient to produce second-plane anæsthesia. The mother breathed normally, but the child did not breathe for ten minutes, and then only after vigorous efforts at resuscitation. Eventually it breathed well, and neither the mother (who afterwards was deeply anæsthetised) or the child showed ill-effects.

In low concentration cyclopropane is non-irritant; laryngospasm is caused only by inhaling very high percentages of the gas. There is no increase in the depth of the respirations and deep anæsthesia may be produced in a few breaths. There is very little increase in the pulse-rate. During induction therefore the greatest care and watchfulness must be maintained.

ADMINISTRATION

Premedication.—In most cases we followed our usual custom of giving omnopon, gr. 1/30 per stone of body-weight, an hour before operation. This dose is as a rule insufficient to cause much depression of the respiratory centre. Some patients were given intravenous Nembutal or Evipan, either alone or after omnopon, or omnopon and scopolamine. After this last combination there was considerable respiratory depression; indeed breathing usually stopped before the abdomen relaxed.

Apparatus.—For the sake of economy carbon-dioxide absorption technique was employed in nearly every case, but often the soda-lime absorbent was not brought into use until after induction, in order to obtain the benefit of the increased respiration. In some cases we even added CO_2 to stimulate deeper breathing and increase the rate of saturation, and often where respiration was unusually shallow no CO_2 absorption was attempted throughout the anæsthesia.

Most patients were intubated with a full-size tube, so that when necessary it was easy to continue respiration artificially by squeezing the bag. The deeper planes of anæsthesia were thus easily obtained and the patient remained in good condition so long as this was kept up.

At first we used the simplest apparatus possible: a well-fitting mask with Clausen's harness, a one-gallon rebreathing bag into which soda-lime was put when necessary, and two glass flow-meters which were specially graduated to measure up to 1 litre of gas in multiples of 50 c.cm. Lately we have used the McKesson apparatus with cyclopropane fittings and CO_2-absorption outfit, but have not found it so easy to use nor so economical of gas as our original simple apparatus.

At the commencement of *induction* the bag is filled with oxygen, the face-piece is firmly applied and cyclopropane then run in at the rate of 250 c.cm. per minute. After about a minute the rate is increased to 500 c.cm. or more, as may be necessary. The oxygen flow is now adjusted to about 250 c.cm. per minute—the quantity required by the patient is quickly ascertained—and after a period which may vary from one to five minutes, the cyclopropane flow is stopped completely. Induction is remarkably quiet and excitement is seldom seen. There is neither coughing nor laryngeal spasm, nor are respirations increased; they are in fact usually very shallow, especially when preliminary narcotics have been used. In these cases respiratory movements may even cease altogether without the supervention of true fourth-stage anæsthesia, for the patient is not completely relaxed. If full muscular relaxation is necessary the patient is intubated and respiration continued by squeezing the bag. The deeper planes (with relaxation) are thus easily obtained and the patient remains fit so long as the artificial respiration is kept up. Once relaxation is attained the mixture in the bag is weakened by addition of more oxygen and spontaneous respiration usually begins very soon, the patient afterwards remaining relaxed although the concentration of cyclopropane respired has been considerably reduced. In most cases once the patient has been anæsthetised cyclopropane need be added only at long intervals to make up for loss through the apparatus or to deepen anæsthesia if and when necessary.

PHYSICAL SIGNS

The signs of anæsthesia are exactly the same as those seen with other general anæsthetics, but the administrator who has been in the habit of depending upon the depth of respiration as an indication of the degree of anæsthesia may find himself somewhat at sea with the very shallow respiration of cyclopropane anæsthesia. Actually the degrees of respiratory paralysis are the same although much less obvious. In very early, first-plane, anæsthesia the eyes move. As the patient's respiratory centre becomes paralysed by the action of the gas the respiratory excursion becomes progressively less, until finally the diaphragm alone is carrying on the function of respiration. If the anæsthetic is further pushed diaphragmatic movement becomes more and more depressed until finally respiration is entirely arrested.

Except in cases which have received heavy premedication muscular relaxation occurs early and is very complete—owing, it is stated, to the full oxygenation of the muscles.

Usually the rate of the pulse neither rises nor falls with cyclopropane, but in a few of our cases (all of which we would consider as poor risks with other anæsthetics) changes have occurred in its character. There is sometimes an increase in the rate, but more often a slowing to between 50 and 60 accompanied by arrhythmia which may be due merely to extra systoles or to a true auricular fibrillation. It is remarkable that the beats often were not all of the same power; many which were felt at the apex did not come through when the sphygmomanometer cuff was blown up to within a few millimetres of the systolic pressure. Inflation of the lungs with pure oxygen, followed by reduction in the cyclopropane concentration, always stopped the arrhythmia; but we did not find that atropine had any effect upon it.[8]

OVERDOSE

If excessive amounts of cyclopropane are used induction may be extremely rapid and the patient may pass into fourth-stage anæsthesia in a few breaths. This has to be prevented by careful control of the gas flow, but overdosage is easy if the anæsthetist has had no previous experience with cyclopropane. Apart from the advent of fourth-stage anæsthesia certain alterations in the pulse of several cases have lead us to believe that cyclopropane is not so innocuous an anæsthetic as nitrous oxide or ethylene. It is lipoid-soluble; and patients who have inhaled it in fairly high concentration for long periods have taken a considerable time to recover consciousness, often suffering from severe nausea and vomiting.

ELIMINATION AND RECOVERY

Recovery after cyclopropane anæsthesia is usually fairly rapid and without excitement or other undesirable sequelæ. Speaking generally, the duration of recovery depends on the amount of cyclopropane which has been inhaled and also on premedication. After the lightest anæsthesia, lasting only a brief period, the patient will regain consciousness as soon as he would after nitrous oxide and oxygen and with no more after-effects; but after a high abdominal operation, when he has been deeply anæsthetised for an hour or more, consciousness does not return for a considerable time. It must be remembered that in this type of case deep anæsthesia is necessary up to the end of the operation, in order

to allow the abdomen to be closed; hence desaturation of the tissues has hardly begun when the patient leaves the operating-table. In all but high abdominal cases, however, anæsthesia may be progressively lightened as soon as muscular relaxation has been achieved, and recovery of consciousness is thus made much more rapid. Many patients actually speak as the dressings are being applied. We have had no trouble with the breathing and the patient's colour remains good throughout the period of recovery.

Nausea and vomiting is not absent. It is definitely less than with ether but more than with gas-and-oxygen, even in cases which have only had light anæsthesia equivalent to that obtained with gas-and-oxygen.

On the whole cyclopropane affects the patient's metabolism very little; although there is vomiting in a fair proportion of cases there is no evidence of damage to liver or kidney.[9] Waters and Schmidt state that the output of the kidneys is depressed during anæsthesia and shows a compensatory increase afterwards, as with ether and ethylene.[7] The blood pressure, raised during the administration, usually falls to normal within about a quarter of an hour and (except in the presence of surgical shock) does not seem to swing below the patient's normal.

ANALYSIS OF CASE

The accompanying Table is an analysis of the cases on which this report is based. The groups it distinguishes were:—

I.—Light anæsthesia without relaxation. These cases included operations ranging from dental extractions and tonsillectomy to amputation of breast.

II.—For the most part comparatively short abdominal operations such as appendicectomy and hysterectomy. This group also includes 5 cases of nephrectomy.

III.—Long upper abdominal operations with a large proportion of gastrectomies, of which a relatively large number are performed at the hospital. They require careful handling from the anæsthetic point of view.

IV.—Toxic thyroid cases. These afford a good test for an anæsthetic agent, and for this reason they are grouped separately.

The cases which proved fatal may be summarised thus:—

1. Tumour of kidney .. Died 12 hours after of shock.
2. Œsophagectomy .. Died 2 hours after return to ward, fit until pneumothorax during operation. Cyanosed.
3. Carcinoma stomach and œsophagus. Died on operating table (see below).
4. Gall-bladder .. .. Died of pulmonary embolism.
5. Carcinoma gall-bladder . Died 3 days after. Bad risk. Jaundiced.

In Cases 1, 2, 4, and 5 the patient's death can hardly be attributed to the anæsthetic.

CASE 3 was a man with neoplasm of the stomach, high up and extending into the œsophagus. His age was 52, and he gave a 6 months' history of pain, vomiting, and rapid wasting. Weight 8½ st., hæmoglobin (after blood transfusions) 66 per cent. After premedication with omnopon gr. 8/30 induction was uneventful. The patient was intubated, and relaxation, which had to be full, could be obtained only by artificially inflating the chest, the patient having ceased spontaneous respiration before relaxation was complete. Oxygen was running at 3 litres per minute and cyclopropane at 300 c.cm. per minute.

The abdomen had been opened about five minutes (this was about twelve minutes from the commencement of induction), and the bag was being squeezed rhythmically about 20 times a minute, when the patient became pale and the pulse vanished. The lungs were immediately inflated with pure oxygen, but all efforts at resuscitation (including heart massage and injection of adrenaline into the heart muscle) were in vain. Unfortunately we were unable to obtain a post-mortem examination. The case was a poor risk, and the heart was evidently unable to stand up to the stress of deep anæsthesia.

SUMMARY

After a fairly extensive trial we are of opinion that cyclopropane, despite its disadvantages, is a valuable anæsthetic and that it has properties not possessed by others. It seems to be chiefly useful for obtaining deep anæsthesia or for fortifying gas-and-oxygen temporarily. The latter is so innocuous that we see no reason to suggest that cyclopropane should replace it when light anæsthesia is all that is required.

One of the disadvantages of cyclopropane is said to be its cost. With the technique described we used about 2½ gallons for an hour's anæsthesia, which at present costs 7*s.* 2½*d.* Expense, therefore, can hardly be regarded as an objection, especially as the price of the gas made in Britain will be considerably lower. A real disadvantage is that of bleeding, and although we have used cyclopropane for breast and thyroid operations we prefer gas-and-oxygen for this purpose. In one or two cases in which the patient already had a high blood pressure cyclopropane has been given with great care and without ill-effects; curiously, the blood pressure rose only three or four points.

Induction is always pleasant for the patient, with no sensations of bursting, throbbing, or choking, such as are sometimes complained of with other anæsthetics. Although the odour of cyclopropane as it issues from the cylinder is not pleasant, patients are not aware of it during induction, nor do they complain of unpleasant taste or smell during the recovery period such as is associated with ether. We have never failed to obtain complete abdominal relaxation, although it has often been necessary to increase respiratory exchange by artificial methods. When this artificial respiration is resorted to it must always be borne in mind that one is dealing with an extremely potent agent which is not without its effect on the heart muscle.

Group	Number of cases.	Nausea only.	Vomited.			Percentage of patients complained of nausea or vomiting.	Headache.	Restlessness.	Collapse.		Respiratory complications.	Died.
			(1)	(2)	+				Mild. (1)	Severe. (2)		
I.—Light anæsthesia ..	106	10	20	10	3	40·4	5	12	3	0	1	0
II.—Lower abdominal ..	44	4	8	3	2	38·6	0	5	1	1	0	1
III.—Upper abdominal ..	87	4	14	8	5	35·6	0	17	5	4	2	4
IV.—Toxic thyroid	13	0	4	0	2	46·1	1	1	2	2	0	0
—	250	18	46	21	12	—	6	35	11	7	3	5

The fact that cyclopropane is neither a respiratory stimulant nor irritant makes it necessary that the anæsthetist should exercise the greatest care in its administration; but in the hands of the expert we believe it to be an anæsthetic of great utility and value.

We wish to thank the house committee and surgical staff of the Cancer Hospital for making this investigation possible. The greater part of the cost of the gas and of the special apparatus was borne by the hospital; but we later received valued help from the Joint Anæsthetics Committee of the Medical Research Council and Royal Society of Medicine. This committee was responsible for the supply of several cylinders of the imported gas and, as the result of successful negotiations with Imperial Chemical Industries Ltd., has secured its manufacture in this country. We also desire to thank Messrs. A. Charles King Ltd., who undertook the troublesome task of importing the gas from America and made suitable apparatus for its use. This they did at cost and without profit.

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WHOOPING-COUGH

THE DIAGNOSTIC SIGNIFICANCE OF BLOOD COUNTS

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Two laboratory methods are commonly used in the early diagnosis of whooping-cough. The first consists in the isolation of the bacillus of Bordet and Gengou on specially prepared blood plates, and appears to be of established value in the earliest stages of the disease. The second depends on changes in the number or type of circulating leucocytes, and towards this method attention has been solely directed in the investigation here described.

Blood counts have been employed in the diagnosis of whooping-cough for over a quarter of a century. Ever since Frölich [1] made the fundamental observation in 1897, leucocytosis has been regarded as characteristic of the disease. Extreme figures have been recorded in pertussis pneumonia. Mitchell and Friedman [2] reported a case where 233,600 leucocytes were present and clinical evidence did not suggest leukæmia. Figures of this magnitude are never reached in uncomplicated cases; indeed a true evaluation of the degree of leucocytosis can only be obtained when the figures are compared with the normal blood counts of childhood. It is occasionally difficult, from the scrutiny of reported results, to decide whether such a comparison was made.

Besides an absolute increase in the number of leucocytes, a relative increase in lymphocytes has long been recognised. As early as 1906 Churchill [3] found that lymphocytosis was present in 85 per cent. of recorded cases. This change, he thought, was commonest in the early or catarrhal stage of the disease. More recently Sauer and Hambrecht,[4] whilst confirming the general presence of leucocytosis and lymphocytosis in whooping-cough, found that the change was greatest at the height of the paroxysmal stage; at the beginning and end of the illness there was often leucopenia. They also noted a terminal decrease in the lymphocyte count.

The present investigation describes the blood count findings in 65 cases of whooping-cough. Most of these were in the late paroxysmal or early whooping stage of the disease and ages ranged from 3 months to 9 years. A division into age-groups has been made for convenience of comparison with Still's table of normal blood counts in childhood (Table I.).

TABLE I

*Normal Blood Counts in Childhood (Still)**

—	Birth.	Seven days old.	Six mths.	Two years.	Five years.	Ten years.
Total reds ..	5–10 mil.	3–6½ mil.	5½ mil.	5½ mil.	5½ mil.	5½ mil.
Hæmoglobin	132–138%	112–138%	70%	75%	80%	85%
Total leucocytes.	24,000–62,000	14,000–15,000	15,000	13,000	11,000	9,000
Polymorphonuclear.	78–80	28–35	35	40	55	60
Lymphocytes.	20–22	52–58	57	52	37	32
Eosinophils.	—	0·4–2·4	1·5	1·5	1·5	1·5
Large monos: transit and basophils.	—	5·6–17·6	6·5	6·5	6·5	6·5

Mil. = millions.

* Still, G. F.: Common Disorders and Diseases of Childhood, London, 1927, p. 699.

Blood counts, which consisted of a total and differential leucocyte count, were performed at two stages in the disease—on admission and in early convalescence. The figures obtained were then compared with Still's table and the results expressed as plus or minus normal for the particular age-group. In an attempt to obtain uniformity of results, all the examinations were done by one of us (M. F. C.).

In order to classify the findings a salient abnormality, the increase in percentage of lymphocytes, has been used as the best criterion of variation. Four groups were obtained as follows:—

Group 1) Increase in percentage of lymphocytes: 25% or more
" 2) 10–25%
" 3) 2–10%
" 4. No significant increase.

RESULTS OF INVESTIGATION

An absolute increase in the number of leucocytes was present in every case; increases amounting to over 30,000 were occasionally obtained. On an average, each case was shown to have 10,064 leucocytes more than was normal for the age. It should be emphasised that we were dealing, almost exclusively, with uncomplicated cases of whooping-cough in the late paroxysmal or early whooping stage.

Lymphocytosis was less constant. The results in the various age-groups are given in Table II. It will be seen that lymphocytosis characterised some 77 per cent. of cases, and in 35 per cent. this change was marked. On the other hand, as many as 23 per

cent. showed no increase at all. A second point is worthy of attention. In the age-group under six months only 17 per cent. of children showed a marked lymphocyte increase and no less than 33 per cent. showed no increase at all. No other significant difference between the various age-groups was detected.

TABLE II

Percentage Distribution of Children According to Lymphocyte Increase in Various Age-groups

Age-group (years).	No. of cases.	25% or more.	10–25%	2–10%	No significant increase.
0–½ ..	6	17	50	0	33
½–2 ..	21	38	48	0	14
2–5 ..	30	37	33	6	23
5–10 ..	8	37	25	0	38
—	65	36	38	3	23

Leucocyte Counts in Early Convalescence.—The next part of the investigation was an attempt to obtain some information as to the time at which blood counts returned to normal. For this purpose in 36 patients, who had showed abnormalities in the early count, the examination was repeated fourteen days later. It was revealed in consequence that in each case, by the fourteenth day of the whooping stage, the leucocyte count had returned to physiological limits. This was equally true, whether the initial lymphocytosis had been marked, moderate, or mild.

DISCUSSION

Certain qualifications must be made to the wholesale acceptance of blood counts in the diagnosis of whooping-cough. Although a general leucocytosis appears to be constant, this is not in itself of great value, since almost every respiratory infection of childhood is accompanied by an increase in circulating leucocytes. A combination of cough, leucocytosis, and lymphocytosis is strongly suggestive, but a relative lymphocytosis is shown to be absent in 23 per cent. of cases—a considerable margin of error for a laboratory aid to diagnosis. This margin, unfortunately, appears to be accentuated in the very young—just when difficulties in diagnosis are most likely to arise. In spite of these objections a blood count must remain a valuable accessory method of diagnosis in whooping-cough. Characteristic leucocyte changes are present in a high proportion of cases and are at their maximum before the whoop appears.

SUMMARY

(1) In whooping-cough leucocytosis is constantly present. Lymphocytosis is less constant and this is particularly so in children under six months of age. (2) The blood changes are at a maximum early in the disease and rapidly subside after the whoop is established.

We desire to acknowledge our indebtedness to Dr. E. H. R. Harries, medical superintendent of the North-Eastern Hospital, for his coöperation and for his permission to publish this paper.

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RESECTION FOR CARCINOMA OF THE SIGMOID AND SIGMOID RECTUM

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FOR knowledge of the technique and results of resection and permanent colostomy in cases of cancer of the sigmoid and sigmoid rectal areas, we are indebted to W. E. Miles,[1] William J. Mayo,[2] Daniel F. Jones,[3] Robert C. Coffey,[4] Frank H. Lahey,[5] and Fred Rankin.[6] For many years we all have hoped to have established an aseptic technique for resection of the sigmoid and sigmoidal rectal area in cases where the size of the tumour makes it unsuitable for removal and anastomosis either by the Paul-Mikulicz technique, the Morrison-Balfour technique, or anastomosis with suture. The procedures that the above-named authors have advised consist in a two-stage operation

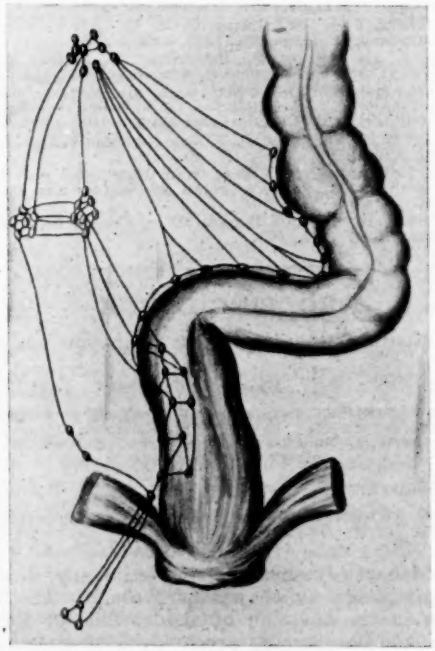

FIG. 1.—Extramural lymphatic structures of rectum and sigmoid (after Miles).

for the radical removal of the tumour and a permanent colostomy. In all these operations the bowel is double-clamped intraperitoneally and the proximal end brought out for the permanent colostomy opening. Most of them, except Lahey, have advised burying the distal segment under the floor of the pelvic peritoneum and its removal at a later stage.

I disagree entirely with this technique, because the simple clamping of the bowel damages the intestinal wall so severely that hordes of bacteria, both microscopic and ultramicroscopic, are spilled into the peritoneal cavity. For years, we have all recognised that the greatest danger in these operations is peritonitis—whether due to direct implantation resulting from severing the colon, to infection in the neighbouring mesentery or to tension causing a leakage of bacterial contents into the peritoneal cavity. In

the procedures described below, I feel that we have arrived at the most aseptic method of removal so far described.

In the first stages the cæcum is withdrawn through a McBurney incision and anchored there for 48 hours. This can be done by applying a clamp to the mesentery of the appendix or suturing the parietal peritoneum to the mesentery, care being taken that at no time is a needle inserted in the colon proper for fear of infection. A Paul's tube is then introduced after 48 hours and a suction apparatus connected of the Wagensteen type. Because of the loss of fluids, we have to give 5 per cent. glucose and normal saline solution by intravenous injection and also by clysis, up to 4000 to 5000 c.cm. during the first few days. Blood transfusions are ordered as the need arises. When the condition of the patient warrants it, he is sent home for a two months' rest, before the radical abdomino-perineal operation is performed.

FIG. 2.—Sagittal section showing peritoneal reflection.

Upon return to hospital, a complete check-up is made. The administrations of transfusions, glucose, and saline solution, and also the application of an indwelling catheter are ordered. A median or left incision is now made and the mesentery of the left colon is resected from a point above the growth down through the peritoneal reflection, the gland-bearing area being excised (Figs. 1–3).* The abdomen is

FIG. 3.—Resection of sigmoid and sigmoid rectal by the abdominal route.

temporarily closed, and the patient placed in the lithotomy position for perineal resection. The anus areas is painted with iodine, and gauze soaked in iodine is introduced into the rectum. The aperture is then closed with a continuous suture so that more iodoform gauze can be applied to the lower segment and this, in turn, is enveloped in a sterile rubber glove. The perineal incision is made preferably with a cautery and continued until sufficient rectum extrudes, as shown in Fig. 4, in order that a second sterile glove can completely envelope the lower bowel segment. After dissection up to the peritoneal reflection, the abdomen is re-entered, the peritoneal reflection dissected, and the entire loop drawn upward into the abdominal cavity. It is then carried through a separate incision made through the left rectus muscle for the purpose of fashioning a single-barrel colostomy. The peritoneal reflection is closed; the cut edges of the sigmoid mesentery are sutured to the left parietal peritoneum to prevent herniation,

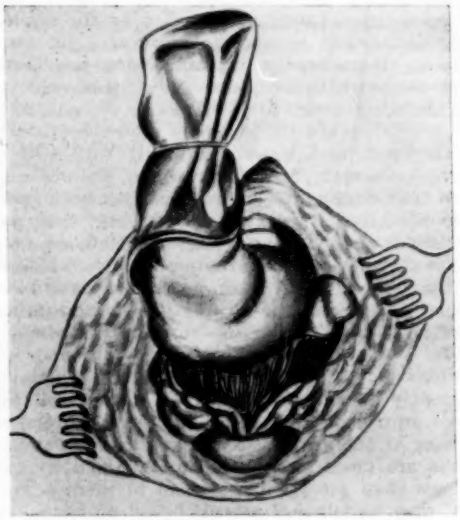

FIG. 4.—Perineal dissection of rectum.

and the incision in the abdomen is also closed in the usual manner. The extraneous gut is double-clamped a few inches from the colostomy opening and severed with a cautery. In the operative procedures that I have described, not once have we used clamps across the lumen of the bowel nor have we severed the colon by cautery intraperitoneally; nor do we permit any suturing of the colon wall to the parietal wall of the peritoneum.

The so-called aseptic procedures utilising various forms of clamps are, in my opinion, misnomers, as the traumatism applied to the bowel by these clamps is sufficient to cause much of the peritonitis in cases of malignant disease of the colon.

The post-operative care of these patients is very important. They are made comfortable by the use of morphia, and 4500 c.cm. of glucose and saline solution is given by hypodermic clysis or intravenously for the first few days. In all my cases I have used an indwelling catheter and have given irrigations of boric acid for at least one week after operation. Parotitis is a complication which causes some anxiety, but in recent years the early use of radium has had a favourable influence.[7] Repeated blood transfusions are given as indicated by the condition of the patient.

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* These illustrations have appeared in a paper on resection for carcinoma of the sigmoid and sigmoid rectum, Surg., Gyn., and Obst., 1934, lix., 762.

CLINICAL AND LABORATORY NOTES

EXOPHTHALMOS IN AN AGED SPINSTER

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We are familiar with exophthalmos accompanied by varying degrees of enlargement of the thyroid gland during the early decades of adult female life, but I have recently had under observation a case of exophthalmos with atrophied thyroid in a spinster 84 years of age. The vagaries of the thyroid gland, with or without accompanying exophthalmos, form an interesting study. In simple goitre the thyroid may reach a considerable size, encircling the front of the neck and, apart from pressure, may cause little inconvenience, whereas a comparatively slightly enlarged thyroid may be attended by the unpleasant and distressing symptoms observed in Graves's disease. Occasionally the latter may run a rapidly fatal course. Some years ago I was called to a neighbouring town to see a young woman, 20 years of age or thereabouts, who was the subject of one of the severest and most distressing forms of acute Graves's disease. A healthy woman, she was engaged to be married, but the engagement had been suddenly broken. After two sleepless nights the patient developed exophthalmos with distinct enlargement of the thyroid gland, had a rapid pulse which could hardly be counted, accompanied by audible and visible beating of the heart. Treatment failed to slow the action of the heart or to give the slightest relief. Patient died on the fifth day of her illness.

While exophthalmos and thyroid implications are frequently associated in Graves's disease, the extent of the protrusion of the eyeballs bears no relation to the size of the goitre. Small and medium-sized soft goitres are more frequently accompanied by exophthalmos than are the larger, and in them a marked thrill may be felt and a bruit heard on auscultation.

It was towards the close of last year, when the elderly patient above mentioned was 83 years of age, that exophthalmus developed and rather rapidly increased. For over 40 years she had consulted me at irregular intervals for heart trouble, mitral regurgitation. During the last decade or a little more, she became the victim of widely distributed rheumatoid arthritis affecting the fingers and toes, but apart from occasional indisposition her health remained on the whole good, until three years ago when she began to lose flesh and had pains in the abdomen. Two fairly large irregular masses could be felt, one in each side of the abdomen, and which at times were painful on pressure. The glands in the groins became enlarged and the superficial veins in the lower left abdominal wall became dilated to the size of a quill pen. Under the administration of colloidal copper the hard masses referred to became reduced in size to almost vanishing point. The superficial veins in the abdominal wall also became markedly smaller and with the subsidences her general health improved.

In the early months of this year it was noticed that the eyeballs had become protuberant and staring, a circumstance which gave anxiety to her friends. The exophthalmos progressed so that the eyelids could not be closed entirely. The globes were at times painful, and from the orbits at intervals there gushed streams of clear water. The pupils, then and all through her illness, remained normal; the pulse ran between 70 and 82. The condition of the heart remained little altered: occasionally there was slight irregularity which improved with cardiac tonics. Emaciation progressed with the result that no thyroid gland could be felt; the rings of the trachea could be seen and traced all the way down. There was neither palpitation, undue restlessness, nor vomiting; the extremities were always cold, and the urine was free from albumin, sugar, and aceto-acetic acid. There were no signs of incipient myxœdema; her brain was active and her mind alert. In the course of the illness there was for a few days double vision, and in March the urine for the first time contained albumin.

A few weeks later as there was a return of the diplopia Mr. J. S. Arkle, an eye specialist, saw patient with me. He attributed the diplopia to unequal strain upon the ocular muscles. He found the discs normal and that there was no congestion of the retinal vessels. No explanation could be given of the exophthalmos or of the gushes of liquid which were still considerable. Drops of purified petroleum were ordered to be inserted into the eyes, and the patient to wear and to sleep in special glass protectors. In May the gushing of liquid from the eyes ceased, the urine contained a larger trace of albumin, and œdema of the feet developed, but in a few days the œdema disappeared under the influence of digitalis, juniper, and squill.

As the illness progressed patient lost flesh rapidly; she became restless, sleepless, and excitable; she became the subject of delusions, saw all manner of living objects in her room, and talked audibly to herself. Bromide and codein gave relief, but it was not until two or three half-grain tablets of calomel had been taken that her mind became clear. I regarded the symptoms as toxæmic. As the end drew near, Cheyne-Stokes respiration became marked, the heart's beat irregular, and the pulse, which had fallen to 56, rose to 146, the respirations reached 56, and the temperature 102° F. Patient died in coma.

The marked and rapidly produced protrusion of the eyeballs in my aged patient never seemed to me to be explained by thyroid influences, for the gland was atrophied, nor directly through the sympathetic nerves. Its rapid development, pain in the eyeballs, and the gushing of clear water from them in such quantities as to saturate in a very short time two or three handkerchiefs suggested some local condition behind the eyeball itself. Prof. R. B. Green, my colleague in the College of Medicine, with whom I discussed the subject, also thought that the cause, secondary if not primary, lay within the orbital cavity. He drew my attention to an article on Periorbita in Prof. S. E. Whitnall's "Anatomy of the Human Orbit" (1932), in which is described a mass of smooth muscle tissue lying in the inferior orbital fissure, and incorporated with the periorbita, which like periosteum is a sheet of fibrous tissue lining the interior of the orbit and supporting the nutrient arteries of the bone. This muscle, known as the orbital, has been described by H. Müller and is not to be confused with the involuntary palpebral muscle which also bears his name. He calls it the "periorbital." It fills the inferior orbital fissure, and in proceeding forward it spreads out in a fan-shaped manner over the orbital floor. Whitnall, from whose interesting and suggestive article I have borrowed freely, ascribes to it a twofold interest. The muscle is found in all mammals except those of the aquatic group. O. Burkard, who has studied it from the point of view of comparative anatomy, holds that it is an important accessory to the lacrymal apparatus. Its function however in this respect is not clear, but in

(*Continued from previous page*)

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certain animals, in addition to keeping the globe tense, it can protrude the eyeball, as Müller found on irritating the cervical sympathetic nerves.

The second point of interest is a pathological one and concerns the exophthalmos of Graves's disease. It might seem impossible for contraction of the periorbital muscle, which is a vestigial structure, to alter the position of the eyeball by compressing the mobile orbital fat and obstructing the venous circulation, but H. Frund, who has carefully studied the muscle in the new-born, considers the explanation is sufficient. If we admit with him that the periorbital muscle might cause protrusion of the eyeballs, its contractions would primarily have to overcome the pull normally exercised by the recti muscles unless these had become functionally weakened and inefficient. Despite the careful investigations which have been made into the pathology of exophthalmos, there would still appear to be a call for further research into its primary cause or causes.

DUODENOCOLIC FISTULA

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The rarity of this condition and the recent publication of a similar case [1] prompt me to report the following:

A man, aged 69, was admitted to the Municipal General Hospital on Sept. 28th, 1935, with a history of intractable diarrhœa for three months, preceded by severe constipation. During the last few weeks vomiting had set in. The vomit at first was mostly clear fluid, but later became fæcal and very offensive. He had lost a lot of weight and complained of pain across the chest.

On examination he looked grey, dehydrated, and wasted. His temperature was subnormal, the pulse- and respiration-rates rapid. Flatulence was marked. There was tenderness all over the abdomen and rigidity over the upper part of the right rectus. No mass was felt. The tongue was thickly "coated" and the breath foul. The heart showed dilatation, and the lungs crepitations at their bases. The pupils were slightly dilated and the knee-jerks sluggish. The stools were frequent and very loose. He went downhill quickly and died 36 hours after admission. While in hospital he had no diarrhœa at all. At autopsy, which I performed a few hours afterwards, the heart was found to be flabby and enlarged, and the lungs congested at the bases. The liver had a nutmeg appearance; the gall-bladder was full and tense and had a puckered cicatrix posteriorly; there were no gall-stones; the pancreas was hard, the prostate enlarged, and the peritoneal cavity clean; the intestines were deflated except the cæcum which was ballooned. The hepatic flexure, duodenum, and head of pancreas were matted together and very friable, particularly between the duodenum and the flexure, where a perforation was noticed (probably artificially produced during the handling of the parts). On section a fungating mass was found in the hepatic flexure, ulcerating through into the duodenum and forming a fistula about half a centimetre in diameter. Microscopically the growth was found to be a diffuse adeno-carcinoma invading the intestine deeply. A section from the middle of the body of the pancreas showed tissues of the character of intestinal mucosa. No other secondaries were found.

This, then, was a case of duodenocolic fistula due to an adenocarcinoma of the hepatic flexure. A curious point about it was that the patient himself informed me that he had "cancer of the bowel," but emphatically denied being told so by anybody. The stools, although frequent and very loose, were not steatorrhœic, as seen by the naked eye. The condition was not recognised before death, because full investigations were not carried out in the short time during which the patient was seen alive.

I am indebted to Dr. D. C. Lamont, medical superintendent of the hospital, for permission to publish this case.

[1] Mindline, J., and Rosenheim, M. L.: Duodenocolic Fistula Simulating Idiopathic Steatorrhœa, THE LANCET, Oct. 5th, 1935, p. 764.

MEDICAL SOCIETIES

JOINT CONFERENCE ON THE WELFARE OF CRIPPLES AND INVALID CHILDREN

Mr. H. S. Souttar presided over a meeting held last week at the Drapers' Hall, Throgmorton-street, during the joint conference on the welfare of cripples and invalid children.[1] The subject of discussion was

The After-effects of Accidents

Speaking of fractures due to accidents, he said that one of the great difficulties was not repairing the fracture so much as repairing the men and getting them back to useful life. If a man's compensation provided him with a satisfactory income his enthusiasm for work was not great. That did not apply to the child, but even with the child the problem of restoring full function was of the greatest importance. These issues were the more important because the number of accidents was increasing.

Lieut.-Colonel J. A. Pickard (National Safety First Association) said that accidents of all kinds killed 3000 children annually, half of that number in road accidents, while for every fatal road accident there were 30 non-fatal ones. More foresight and care on the part of drivers as well as the cultivation of road sense in the child, without any great curbing of his natural spirit of adventure, was essential. Of 500 road fatalities to children 386 occurred to children on foot, 103 to those cycling, and 11 to passengers. He advocated a much larger use being made of models and films to teach road dangers to children.

Dr. H. C. Cameron (Children's clinic, Guy's Hospital) spoke of the effects of accidents on the nervous system. Cerebral damage or compression, or contusion or concussion might occur, and occasionally persistent atrophy of brain or a traumatic dementia. There might result extreme excitability and restlessness, with disturbances of conduct; while injury to the head might be followed by convulsions, and lack of moral control, possibly with epilepsy. Functional disturbances were a very prominent sequel of accidents, because of their terrifying effect, even if the child had merely seen the accident without being involved in it; the attitude of the accompanying adult could influence the child's disturbance, for good or ill. Often a state of unrest was caught from the grown-up person, and might be manifest as mutism or hysterical convulsions.

Mr. S. A. Malkin, F.R.C.S., (Harlow Wood Orthopædic Hospital), spoke of the need for coöperation

[1] Under the auspices of the Invalid Children's Aid Association and the Central Council for the Care of Cripples.

between cottage, general, and orthopædic hospitals in this work. The medical profession had long been dissatisfied with some of the results of the treatment of accident cases, but there was now a steady improvement. The British Medical Association Committee on Fractures had attributed the bad results not so much to lack of professional skill as to lack of organisation or faulty organisation. Cottage hospitals were mostly staffed by men with busy private practices, who had neither time nor opportunity to work a fracture service. Orthopædic hospitals were in a specially favourable position to treat fractures. In any scheme formulated municipal hospitals should be included. The best link would probably be one surgeon in charge of the fracture service on the staff of all the associated hospitals, appointing such assistants as were needed.

Dr. ELIZABETH CASSON (Dorset House School of Occupation Therapy) spoke on occupational therapy as applied to recovery of children from accidents. Occupational therapy included any activity, mental or physical, designed to contribute to and hasten recovery from disease or injury. Concentration by the patient on the cure of his condition sometimes retarded it; occupation often resulted in unconscious movement of the injured member. Every muscle action was the result of a stimulus, and a desideratum of occupational therapy was to arouse specific emotions which resulted in the desire to use such muscles as would aid restoration of health; then came the desire to achieve.

Mr. CECIL KNY (late adviser to the Government on industrial development) pleaded for a widening of the existing conception of training cripples. A trainee had to master many functional operations before becoming a skilled craftsman. The radio industry was one well suited to many cripples. He favoured the establishment of an industrial training workshop for cripples, to be run on a business basis; it should have a psycho-technical department for the vocational selection.

Dr. G. MACFEAT (Douglas, Lanark) spoke of a plan of treating cases of accident in the coal industry, based on the coöperation of doctors, employers, and employees, which had received the unanimous approval of the Lanarkshire Orthopædic Association. Efforts were also made to procure suitable light work for those unable to resume their ordinary work.

Dr. J. GREENWOOD WILSON (Cardiff) said that a municipal fracture service would be opened at Cardiff in a few days, with 6 male and 6 female beds, X ray installation, and a staff consisting of orthopædic surgeon, sister, and nurses. Cases needing long treatment would be transferred to another hospital under the same surgeon.

Dr. C. O. STALLYBRASS (Liverpool) said that in Liverpool street accident cases must be taken to the nearest hospital, whether municipal or voluntary, where the orthopædic surgeon would see them through to the end of their treatment.

Mr. D. R. WILSON (H.M. chief inspector of factories), who presided when the discussion was resumed after lunch, said that last year there were 136,858 accidents in factories, 785 being fatal. The total number of accidents including those on roads and railways and in mines probably reached nearly half a million, and the fatalities 9000 to 10,000. Among young workers the accident rate was persistently higher than among older ones. He had often wondered what ultimately happened to the man disabled in industry, often through no fault of his own.

Mr. J. L. SMYTH (Social Insurance department, Trades Union Congress) said that for more than a century trade unions had been protecting workers against the hazards of industrial life. After an industry had finished with him the crippled worker was largely left to his union. In this country there was no properly organised accident prevention service, though the great bulk of the accidents were preventable. Those returning to work after long periods of unemployment were very prone to accidents. The injured worker who did not belong to a trade union was often tricked into accepting a quite inadequate sum as total compensation. Home Office statistics showed, in ten years, that the average profit made by the insurance companies in cases of injury to workers was over 12 per cent., and the legal and medical charges 36 per cent., the amount actually paid in compensation being 54 per cent. The trade union movement had framed an improved Workmen's Compensation Bill, which ought to be warmly welcomed.

Mr. GUY DE G. WARREN (Midland Colliery Owners' Mutual Indemnity Company) said that colliery companies in the Midlands had banded themselves together to protect their common interests; among their objects were the promotion of measures to prevent accidents, ill-health, or sickness, and to minimise the consequences thereof. A workman immediately after an accident was anxious to be restored to his work as soon as possible; if, however, his period of incapacity was prolonged he tended to become content to remain on compensation. It should be an obligation on the employer to provide efficient treatment, with medical referees to decide in cases where treatment was refused.

Mr. H. SAMUELS (Industrial Welfare Society) said that the original object of the Workmen's Compensation Acts was to protect the workman against the risk of accident at his work; yet the figures of accidents in industry showed no signs of lessening. The insurance companies did not reduce premiums in favour of employers who took steps to prevent accidents. If a system of "merit rating" of workmen's compensation premiums could be introduced, each firm would have a direct financial incentive to adopt up-to-date methods of accident prevention. With regard to cure, the financial provision given by the Acts was likely to promote cure; yet it was inherent in the system that the injured workman should often have to struggle with the insurance companies. In certain cases the employer could compel the acceptance by the worker of a lump sum in compensation, and then the man's mind became fixed in anticipation of this sum, instead of on getting well. His society welcomed the official committee set up to inquire into the system of medical examination of injured workmen, but his society felt that a mere amendment of the law was not sufficient; there should be national rehabilitation centres for the treatment of industry's daily victims.

Mr. DONALD NORRIS, F.R.C.S. (Insurance Institute of London) said that every year 400,000 claims were made in respect of disability from industrial accidents and diseases, and the annual cost of these was about seven million pounds. About 4 per cent. of people working in factories and railways, 10 per cent. in docks, and 20 per cent. employed in mines were disabled annually. His suggestion was that the main reasons for the present high cost and excessive duration of disability were: (1) inadequate preventive measures, (2) inefficient treatment, (3) difficulties in placing the workers in industry, (4) litigation. His impression was that the treatment of other injuries was not as a rule much better than that of

fractures. A vast total disability could be obviated if trivial injuries were not allowed to become septic. Many thousands of injured workmen attended hospitals thrice a week for massage and electrical treatment which were not effective.

Mr. GEOFFREY PETO, M.P. (Central Council for the Care of Cripples), wanted to see a Workmen's Restoration Act.

Mrs. Councillor DEACON (North Staffordshire), who said she had for long been living on 29*s.* 6*d.* a week, protested against the forcing of injured workmen to accept ridiculous sums as compensation, and against the delay before any payments were commenced.

Dr. H. E. MOORE (Crewe) agreed there was often a long delay between the occurrence of the incapacity and the possession of the papers entitling to payment. He joined his plea for the establishment of rehabilitation centres.

Dr. D. MORGAN (Trades Union Congress) thought there should be national rehabilitation centres in which the worker could have confidence. He denied any desire on the part of men to prolong the period of payment of compensation.

LIVERPOOL MEDICAL INSTITUTION

AT a meeting of this institution, held on Oct. 24th, with Dr. C. O. STALLYBRASS, the president, in the chair, a paper on

Ephedrine in the Treatment of Enuresis

was read by Dr. R. W. BROOKFIELD. Ephedrine, he said, was generally known to be useful in the treatment of asthma and other allergic states but its value in the treatment of enuresis was insufficiently appreciated. The bladder, like other organs, had a dual innervation. Its nerve-supply was derived through the sympathetic and sacral autonomic (parasympathetic) systems. Relaxation of the internal sphincter and evacuation were favoured by parasympathetic and inhibited by sympathetic impulses. There was reason to suppose therefore that ephedrine, as a sympathetic stimulant, would have a favourable effect in cases of enuresis by contracting the internal sphincter and relaxing the bladder wall. This expectation was fulfilled. His custom had been to give an initial dose of ephedrine hydrochloride half a grain at bedtime, and increase it by gr. ½ every 4–7 days until the enuresis was controlled. Some patients showed a remarkable tolerance to ephedrine; as much as grs. 4 at a dose had been given without any unpleasant results. In many children, on the other hand, side-effects were apt to be troublesome; but these could usually be counteracted. Wakefulness and restlessness responded well to phenobarbitone gr. ¼ given with the ephedrine. Vomiting, which occurred sometimes, ceased on reducing the dose. The results achieved warranted the conclusion that ephedrine is the most useful drug at present available for the treatment of enuresis.

Dr. NORMAN CAPON said he had had some good results with ephedrine, and that it was a useful adjunct to the more fundamental treatment of this state, in which both physiology and psychology are disordered.—Dr. P. F. TINNE condemned disciplinary measures which penalised a child for a condition over which it had no control. Often enuresis was entirely due to the irritation of threadworms in the lower bowel, and cleared up on their removal.—Dr. J. BERKSON remarked on the advantages of ephedrine over large doses of belladonna, from the standpoint of the general practitioner.

Treatment of Infected Bones and Joints

Mr. R. WATSON JONES, in a paper on modern methods of treatment of bone and joint infections (illustrated by cinematograph), said that so far as wounds were concerned the best results would be got by avoiding the infection. The first requirement, therefore, was immediate excision of possibly infected wounds, hæmostasis, and primary suture with adequate immobilisation. When infection was already established, drainage of the bone or joint was imperative, but the question of after-treatment still remained. Whatever technique was adopted it must be equally easy to control the infection and to immobilise the limb. The incidence of pathological dislocation, of pathological fracture, and of postural deformity was far too high, and these complications meant that surgeons, in their anxiety to control the infection, had neglected to control the position of the limb. The Winnett Orr "no-dressings vaseline gauze plaster method" overcame these difficulties, and was especially valuable in the infected compound fracture. Although infection was responsible for delayed union, it was rarely responsible for non-union, and the frequency of non-union was attributable to the inadequacy of immobilisation which had hitherto been permitted. If the fracture was perfectly immobilised throughout the period of infection, and for several months afterwards, bony union was usually secured. The method was of particular value when extensive granulating wounds extended across joints as in the degloved hand, the degloved foot, after severe burns, or in cases of extensive pressure sores. Skin grafts could be employed beneath the plaster. Deformity was prevented, and because fibrosis of the tissues was minimised, the joints often retained their mobility.

Dr. D. WAINWRIGHT said he did not share Mr. Watson Jones's enthusiasm for the use of plaster in the immobilisation of *acute* hæmatogenous infections of bones and joints. He believed that the principles of the Winnett Orr treatment of these conditions could be observed by the use of other methods of immobilisation which had many distinct advantages. The initial treatment differed in no way from that employed by Mr. Watson Jones, but the method of immobilisation by external splinting—for example, the use of a Thomas splint in acute osteomyelitis of the lower end of the femur and upper end of the tibia, and the use of a Jones abduction frame in acute infections around the hip-joint—had the following advantages: (1) the adjacent joint is capable of inspection without removal of splint or dressings; (2) the surrounding skin can be inspected for local spread of infection and subcutaneous abscesses; (3) the external dressings containing the offensive dry pus can be removed without disturbing the granulating surface. Dr. Wainwright said he could personally vouch for the very real anxiety which might often attend these very acute inflammations when the whole limb is completely encased in plaster.

Mr. J. T. MORRISON remarked that the demonstration made the primary treatment of wounds appear altogether too simple. Excision of wounds was a difficult and tedious operation, particularly in cases of bone injury. Such accidents required treatment at least as urgently as abdominal emergencies, and it was strange that the insurance companies had not realised the immense savings they could effect by themselves providing expert hospital

service for the early treatment of such cases as was done in Vienna. During the first six hours operation could be freely undertaken. Thereafter the wound ceased to be merely a contaminated wound and became to an increasing extent an infected wound, with corresponding risk attached to any interference. Referring to the Winnett Orr treatment, Mr. Morrison said he could not see the necessity for complete enclosure of the limb in plaster. Could the surgeon not trust himself or his assistants to keep from interfering with the pack in the wound? There ought in every case to be a definite positive indication for changing any dressing. He agreed with Mr. Watson Jones about the relative unimportance of antiseptics and the great benefits secured by complete rest to an infected wound. He was much impressed with the possibilities revealed in the plaster treatment of patients with severe bedsores.

Mr. BRYAN MCFARLAND said that the best results of compound injuries described at the meeting had been obtained not by the treatment of Winnett Orr, who advocated leaving wounds open, but by primary excision and suture. The speaker had practised this before the Winnett Orr method was introduced, and he still believed that it was infinitely superior. In fact, although Winnett Orr had done one good thing in advocating covering up chronic wounds, whether from bone or more superficial injury, and so had brought people to realise that it was not necessary to keep wiping and dabbing, he thought he had done harm in confusing compound fractures, which were potentially sterile, with acute osteomyelitis, which was essentially infected. For osteomyelitis complete covering with plaster with no window was a bad procedure; for compound fractures it was better to perform primary excision and suture and encase in plaster. If the wound became septic it was much less than if it had been left open, and in 9 cases out of 10 there was primary union without sepsis.

Mr. E. N. WARDLE thought no one could take exception to Mr. Watson Jones's contention that early operative interference is the best treatment for wounds of bones and joints. The more one saw of this kind of case, the more care one took with the primary excision and suture and the better were the results. As for established infection, it seemed to him that the Winnett Orr method had done one great thing; it had relieved patients from a very painful daily dressing. The method was a sound one, but it had its limitations. The wound so treated must be wide and shallow.

ROYAL SOCIETY OF MEDICINE

SECTION OF SURGERY

AT the meeting of this section on Nov. 6th Mr. W. SAMPSON HANDLEY, the president, opened a discussion on

Paralytic Ileus in Acute Appendicitis

The condition, he said, was uncommon, but he had chosen to speak about it because he believed that these otherwise very fatal cases were amenable to timely and energetic treatment of a kind he had described in two Hunterian lectures. Jejunostomy, which seemed to find favour, he did not regard as a solution of the problem; nor did he agree that modern methods of medical treatment had abolished the necessity for surgery. In all the cases of paralytic ileus he had seen, medical measures had been perseveringly tried, and he had been much impressed by the value of the indwelling stomach-tube; but one should beware of postponing operation until it was too late. In operating he did not use spinal anæsthesia, for he feared a dangerous fall in blood pressure.

Even after death "general peritonitis" was rarely found to have spread throughout the peritoneal cavity. One advantage of man's upright posture was this cavity drained to a low point. The dog, without this postural advantage, was killed by peritoneal infection in three days. In man, peritonitis began in the pelvis; even when the septic focus was high in the abdomen, it quickly drained into the pelvis, unless adhesions formed. The pelvis filled with pus from below upwards, and at a later stage hypogastric rigidity supervened. The jejunum, transverse colon, liver, and diaphragm remained uninflamed and unparalysed until the patient became moribund, and this fact was the key to successful treatment. Clinically, therefore, there were three stages of so-called general peritonitis: (1) pelvic peritonitis, (2) hypogastric peritonitis, and (3) the hopeless "text-book" stage. With the first of these gynæcologists were only too familiar: there was acute rectal and vaginal tenderness, but no hypogastric rigidity; there might be vomiting and right iliac rigidity; if the appendix was pelvic in situation it might be felt as a definite swelling. It was on the recognition of the second stage (hypogastric peritonitis), however, that the preservation of life depended. This stage might not last longer than 24 hours.

Intestinal paralysis might arise in the pelvic stage of an upward-spreading peritonitis, but the intestines above the pelvic brim, though distended, were not inflamed. Twenty-five years ago he had applied to this condition the term "ileus duplex" to indicate the presence of two obstructions. Of 3 cases he had treated by ileocæcostomy and cæcostomy, all recovered; whereas of 10 earlier cases treated by other methods, 7 died. Of those 10, 6 were treated by ileocæcostomy alone, and 4 of the 6 died. Cæcostomy should be regarded as a routine precaution, though it might not be essential to recovery in a particular case. The failure of ileocæcostomy in paralytic ileus contrasted with its success in mechanical obstruction of the lower ileum; the speaker had performed the operation 8 times for mechanical obstruction, and had had 7 recoveries; for paralytic ileus he had done it 5 times, with 4 deaths In some exceptional cases in which large intestine obstruction was partial or absent, enterostomy might succeed.

When peritonitis supervened in the hypogastric stage the operative problem became different. It was necessary to construct a short but complete alimentary canal above the level of the peritonitic flood. A distended coil of jejunum was anastomosed to the transverse colon, and the cæcum was opened. Reflux then took place from the anastomosis along the transverse and ascending colon to the cæcostomy. The effect of this on almost moribund patients was dramatic. He had done it five times, with four successes, the fifth patient having died a month later from pyæmia, which bore witness to the intensity of the sepsis. Enterostomy in these cases drained only the small intestine; the large intestine was forbidden by the ileocæcal valve to empty itself into the small intestine, and paralysis of the pelvic colon usually prevented relief per anum. A large anastomosis was not necessary; the large intestine recovered rapidly, and the cæcostomy wound usually closed spontaneously in a month or six weeks.

A late and unexpected sequel of lateral anastomosis between the small and the large intestine without resection or interruption of their continuity was the development of symptoms resembling those of pernicious anæmia; in his first case the interval was eight years. Physiologists had noted that in animals the operation might ultimately induce fatal anæmia, in a way not yet explained. The necessity of carrying out a secondary operation at a remote date in these cases might appear a serious drawback to the measures he was advocating, but surely it was not too high a price to pay for recovery from a condition which otherwise might prove fatal immediately?

The best results from jejunostomy were those recorded by Seton Pringle—namely, 7 recoveries out of 9 cases; but it seemed clear that he did the operation on a prophylactic basis, without waiting for signs of actual obstruction. This policy was defensible, but only a small proportion of cases with free pus in the pelvis proceeded to obstruction, and few surgeons cared to undertake enterostomy except for reasons which were really compelling. German experience of jejunostomy had been less favourable. Selling Brill, of Philadelphia, said it was proper to assume that if a case of peritonitis with signs of obstruction recovered without operation the peritoneal infection was mastered, the fibrinous exudate was absorbed, and the bowel resumed its normal activity. Recent experience at the Mayo Clinic seemed definitely unfavourable to enterostomy in acute obstruction; J. J. Morton, of that clinic, said it tided over the crisis until the real problem could be handled. In Mr. Sampson Handley's opinion enterostomy usually failed because it could drain and relieve only the small intestine; it was useless to deal with only one of two lethal conditions.

Ileosigmoidostomy seemed a rational procedure for cases in which peritonitis was confined to the pelvis, and where the pelvic ileum was paralysed and the pelvic colon merely paretic, but it did not make provision for the emptying of a paralysed large intestine. After one failure he had abandoned it.

Mr. PHILIP TURNER said he had been very unfavourably impressed by the results of surgery in paralytic ileus, though he had not tried the operation which Mr. Handley recommended. There was more than one kind of ileus, and often it was hard to say what kind a patient had. First, there was a preoperative ileus; secondly, an ileus duplex; and thirdly, postoperative ileus. For this last kind he had done a fair number of enterostomies, but almost all the patients had died, and he had accordingly ceased to use the method. The successful cases were those in which the pus was at a low level and there were a few distended coils of intestine low down. For such he used a large trocar and cannula, through which much gas and fæcal matter could come out. He did not leave a tube in. He had come round to a belief in serum in these cases; and he also thought an enema of treacle (not golden syrup, but molasses) was very useful.

Prof. G. GREY TURNER said the mechanical factor in these cases was not always given due attention, and referred to the insistence by the late Mr. Barker, of University College, on the extreme value of excluding a large portion of involved intestine. Many of the cases referred to by Mr. Handley were of a type in which interference was practised too soon and too often. It was hard to know when it was right to operate on these patients who were desperately ill, or when to leave them alone in the hope of a localised abscess forming. As the condition was rare the measures now advocated were not likely to have much effect on the general appendicitis mortality. Some cases had developed fæcal fistula, and immediately afterwards began to get well. He thought the time had arrived for a reconsideration of the whole question of appendicitis, the mortality from which was still far too high. When the trouble was in the lower pelvis, he thought it might be wise to operate in stages, dealing with complications as they arose. In this way the acute stage was survived, and complete removal of the appendix could be done in favourable circumstances. He would like to see a campaign in favour of the earlier and more rational treatment of acute appendicitis.

Mr. VICTOR BONNEY said that when, in 1910, he advised jejunostomy it was for a condition very different from the paralytic ileus which sometimes followed appendicitis. He recommended it for functional intestinal obstruction coming on after any abdominal operation and not dependent on inflammation of the peritoneum. The same functional obstruction occurred after prostatectomy and after peritoneal nephrectomy, and he had seen it twice in pregnancy. It was well recognised as a terminal event in pneumonia, and in his Bradshaw lecture last year he had expressed the view that the condition of the intestine depended on some agent formed in tissues damaged by operation or disease. In that class of case the obstruction started high. Perhaps some such term as "functional peritonitic ileus" would prevent confusion between the two conditions.

Mr. SEYMOUR BARLING (Birmingham) said that in recent years he had drifted towards medical rather than surgical treatment for the cases under discussion. He carried out Mr. Handley's operation soon after the end of the war, and occasionally he had done jejunostomy for them; but on the whole he was hesitating more and more to interfere surgically when medical measures had failed and the patient was in a desperate state. He could not bring himself to carry out such severe operations as anastomosis, though occasionally he had done jejunostomy with some success. His impression was that peritonitis tended to be more erratic in its manifestations than the President had suggested. The danger of trouble arising when the appendix was pointing in the direction of 2 o'clock had been stressed by Mr. Lloyd, after long experience; in these cases there was usually very widespread infection. Ileus was apt to be progressive; distension led to kinking and interference with the circulation, and this to an alteration in the diffusion of gases into the blood. He had always thought that jejunostomy did something to break the vicious circle set up. He believed that many of these patients died of streptococcal septicæmia rather than obstruction. A really irritating brine enema he had found valuable; he had not tried a treacle enema.

Mr. TURNER WARWICK said he had been much impressed by the success of Mr. Handley's combination of ileocolostomy and cæcostomy.

Mr. W. STEWART DICKIE thought that the type of case described by Mr. Handley was not often seen. In such there was no doubt about the obstruction of the ileum, but in reality there was very definite obstruction in the colon. He had been pleased to hear emphasis laid on washing out the stomach. He had no liking for the indwelling tube; a small tube was better than a Crile tube. He had found that a patient who had a rigor usually went steadily downhill.

Mr. W. E. TANNER said that two years ago he had the opportunity of undoing a lateral anastomosis

between the jejunum and the middle transverse colon for ileus. When he opened the abdomen he wondered what the operation had been done for, since the only remnant of a pelvic peritonitis was a single adhesion, half an inch long, joining the intestine to the bottom of the pelvis. That patient had severe anæmia. In one case he had joined the jejunum to the ascending colon for paralytic ileus, and with success; but he passed a long tube through the anastomosis into the small intestine, and it closed in less than a fortnight.

Mr. A. DICKSON WRIGHT spoke favourably of spinal anæsthesia for vaginal hysterectomy and peritonitis with obstruction. When there were signs that a patient was going wrong he passed a very long stomach-tube, so that its end hung in a bowl, and in that way siphonage took the place of elaborate suction apparatus. He gave the patient two days' rest, with a hot pad and morphia; if that failed he stimulated. In his hands enterostomy had not been a success. Spinal anæsthesia would induce an intestine to contract if it retained the power to do so; but it must be a high spinal, 0·8 c.cm. of 20 per cent. ephedrine being given previously. He thought there was no danger of a fall in blood pressure.

Mr. CHARLES DONALD suggested that the severest form of ileus was not associated with much pus; rather it was accompanied by a focal fibrinous exudate round the terminal part of the ileum.

SECTION OF THERAPEUTICS AND PHARMACOLOGY

A MEETING of this section was held on Nov. 12th, with Dr. DOROTHY HARE, the president, in the chair, when Prof. E. C. DODDS opened a discussion on the pharmacological action and clinical use of

Drugs with a Camphor- and Coramine-like Action

Prof. Dodds said that from the general pharmacological standpoint camphor, its related compound the sodium salt of camphosulphonic acid, and a lævorotatory compound which was also known, might be regarded as equally active. One of the main difficulties in studying camphor was its marked insolubility. It might be administered in oily solution and in this form was said to be absorbed from the alimentary tract and, of course, following subcutaneous injection. In the body it was oxidised to an alcohol called camphorol, excreted in conjunction with glycuronic acid; camphorol was inactive and pharmacologically, therefore, the action of camphor could at the best of times only be very brief. Its main action, on the circulatory system, was inconstant, and the same applied to its action on respiration. It was no exaggeration to say that an experienced pharmacologist would find it impossible to support the claims of clinicians that camphor is a powerful stimulant of the circulation and respiration. Its use in collapsed and moribund patients could only be regarded as a placebo. The soluble sodium salt of camphosulphonic acid was no more active.

The compounds of pyridine included the group of circulatory stimulants familiar under the names of nicotine, lobeline and sparteine. One other compound—the β-carboxylic acid diethylamide of pyridine—was more familiar as coramine. All these four compounds had the power of stimulating respiration; from the quantitative point of view, coramine was much the most powerful of them. The injection of such small quantities as 50 mg. into a 2 kg. rabbit produced a very marked change in respiration. The problem arose whether these compounds acted by direct central stimulation or peripherally through the sino-aortic nerve-endings. Nicotine and lobeline in small quantities appeared to act peripherally, but larger doses act by direct stimulation of the respiratory centre. The action of coramine appeared to be merely central. Unlike camphor, coramine exhibited a very powerful pharmacological effect in small doses by mouth or intravenously, a decided stimulation of the depth and frequency of respiration together with an increase in the force of cardiac contraction, shown by an increase in blood pressure. If given in large doses to animals definite evidence of cerebral stimulation could be seen. Since the action on the heart was entirely through the central nervous system, it was unfair to compare this drug with digitalis. There was also good evidence that coramine constricts the peripheral blood-vessels. Clinically the drug had been used extensively in all conditions associated with shock and depressed circulatory and respiratory states. These included diabetic coma, post-anæsthetic collapse, and pneumonia in certain stages.

Prof. Dodds related his own experience of the drug's action in diabetic coma, when the blood pressure was usually low, and the patient suffered from a very depressed circulation, the force of cardiac contraction being poor. In the terminal stages the pulse was imperceptible at the wrist and the colour of the patient very bad. An intravenous injection of large doses of coramine produced an immediate change; the pulse becomes perceptible and the colour returned. If the diabetic condition could be got in hand, such a patient would surely have a very much better chance than one whose circulation has not been stimulated. Other drugs, such as adrenaline and ephedrine, appear to have little or no effect on this condition.

Prof. Dodds sought the opinion of experienced clinicians on the value of camphor injections and on the question whether the stimulation of circulation by means of drugs of this class was a potent factor in cases of the types mentioned.

Dr. R. A. YOUNG said that it was always a joy when a drug, which had been used empirically and believed in, was established by scientific authority. As to camphor, once physicians had been told that this drug was useless, but many had been glad to use it in cases of pneumonia and felt that it did good. Another group of drugs—of which coramine was a notable example—had established itself clinically; it was gratifying to hear that the empirical experience had a scientific basis. He had used these drugs for many years—at first subcutaneously and intramuscularly, and recently by the intravenous route—and had seen very dramatic results. He believed the effect to be continued and valuable, especially in pneumonia. Repeated use had the disadvantage that patients might become intolerant to the needle and develop areas of cutaneous infiltration, redness, and pain.

Sir WALTER LANGDON-BROWN said that in the days of camphor administration he had thought that the drug just swayed the balance in some cases. He was rather surprised to hear that coramine was a cardiac stimulant, as he thought Bernard Myers's work had revealed a depressant action on the heart. He had abandoned it in favour of cardiazol, which was the best cardiac tonic of recent years.

Prof. DODDS pointed out that coramine only acted on the heart by way of the central nervous system.

Dr. PHILIP HAMILL said he had little doubt that cardiazol acted on the isolated heart, improving its beat. It was valuable for elderly patients undergoing anæsthesia; the depth of respiration and pulse volume were remarkably improved. He wondered whether the effect of camphor in oil was due to the very painful cutaneous stimulus caused by the ether. In animals deeply poisoned by morphia coramine and cardiazol gave striking improvement in a few moments. He asked whether they might not in the long run put an unwarrantable strain on a severely intoxicated heart.

Dr. GEORGE GRAHAM asked what change there had been in the blood pressure of patients in diabetic coma and how long it had lasted.—Prof. DODDS replied that the great thing was to control the diabetic condition; otherwise the patient would die anyhow. He personally had never used these drugs in diabetes.

Dr. E. C. WARNER recalled the case of a man who had swallowed a very large dose of camphorated liniment by mistake; at sight of the stomach-tube he had disappeared down the street and never been seen again. He agreed with Dr. Hamill that the ether in camphor injections might be significant. Myers's experiments had been on the perfused heart, thus cutting out the central effect.

The PRESIDENT said he imagined that the temporary stimulus to the circulation would be invaluable in diabetic coma.

Prof. F. R. FRASER suggested that very few physicians had ever seen a permanent effect from these injections; so far only two speakers had been able to produce examples.

Prof. L. J. WITTS described a case of pneumonia in an elderly woman with an irregular heart; 1 c.cm. of coramine every four hours had undoubtedly been followed by steady improvement.—Dr. WARNER said he also had been confident of the value of coramine in cases of pneumonia; it seemed to produce a steady rise of blood pressure—on an average 5 mm.—every 24 hours. He had also used it for dehydrated children, whose circulation definitely improved for half an hour after a dose.

Dr. PHILIP ELLMAN had had some excellent results with coramine, and believed it to be a very valuable drug.

Dr. C. W. BRASHER had had no results from maximum doses.

Dr. W. A. R. THOMSON suggested that if coramine were such an excellent drug in pneumonia the results ought to be conspicuously better in hospitals where it was used than in more conservative institutions. He asked whether coramine had affected mortality statistics or whether its effects were merely temporary.

Dr. GRAHAM referred to published work showing that pituitrin and ephedrine together raised blood pressure while neither alone had much effect.

Dr. J. W. TREVAN observed that in diabetic coma the blood contained large quantities of aceto-acetic acid which was already stimulating the respiratory centre to its maximum. He asked whether physicians wanted a respiratory or a circulatory stimulant.

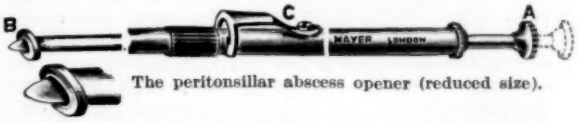
Dr. THOMSON asked if any stimulant other than carbon dioxide and oxygen were needed for pneumonia.—Dr. TREVAN said that the respiratory centre might lose its sensitiveness to carbon dioxide.

Dr. E. A. SCHOTT spoke of coramine as an antidote to Somnifaine, in which it had proved very successful in one case of his.

NEW INVENTIONS

PERITONSILLAR ABSCESS OPENER

THE difficulties often experienced in opening a peritonsillar abscess are overcome by the illustrated instrument. The advantages claimed are: (1) it requires only a small opening of the mouth; (2) the instrument is introduced with the double-edged blade (B) protected in the sheath; it cannot alarm or injure the patient; (3) the blade is kept under tension



The peritonsillar abscess opener (reduced size).

by a spring and, when released by pressing lever C, it produces a sharp and instantaneous, almost painless cut. The length of the blade can be regulated by adjusting screw A; it can be taken out for sterilisation.

This instrument is an improvement on one I described in THE LANCET of 1928, ii., 1344. Messrs. Mayer and Phelps (New Cavendish-street, W.) also make a model with an electric lamp fitted into the barrel.

ARTHUR MILLER, F.R.C.S. Edin.

London, W.

TUBERCULOSIS TREATED UNDER FAVOURABLE CONDITIONS

Dr. JACQUES ARNAUD, medical director of the Sanatorium Grand Hôtel du Mont Blanc, is on the whole encouraging about prognosis in pulmonary tuberculosis when the patient can have pneumothorax and/or sanatorium treatment (Presse méd., Oct. 12th, 1935, p. 1581). His material consists of the 522 employees of the *Assistance Publique* sent from the Laennec Hospital in Paris, and treated between 1925 and 1930. They were between 20 and 50 years old, and almost all of them had undergone a compulsory clinical, radiological, and bacteriological examination at the time the disease was first discovered. Not one of them was lost sight of, and it was found that 5–10 years after the disease was first diagnosed 50 per cent. were dead, 40 per cent. were cured and fit for work, and 10 per cent. were unfit for work either because they were subject to small recrudescences of their disease or because of poor health. What subtracts somewhat from the comparatively high recovery-rate of 40 per cent. is the fact that these patients enjoyed exceptional facilities for recovery. As soon as the disease was diagnosed their work ceased, but not their salaries; and there was no sanatorium waiting-list to mock them. The cures were effected at the cost of 1–4 years' treatment—a very different matter to the three months or thereabout with which the sanatorium treatment of an older generation raised such absurdly false hopes. Eighty per cent. of all the relapses occurred within two years of resumption of work, and they were much more frequent among the patients recovering after a rest cure than among those recovering under treatment with artificial pneumothorax. Asking himself how matters can be improved, at the one end by earlier diagnosis, and at the other end by more effective treatment, Arnaud makes two pertinent suggestions. The first is a system of periodic radiological examinations of the whole community with the object of reducing the present high proportion of cases found to be already advanced when first seen. His therapeutic suggestion concerns artificial pneumothorax treatment which 99 of his 522 patients enjoyed. He believes that it could with benefit be extended to at least 40 per cent. of such patients as his.

REVIEWS AND NOTICES OF BOOKS

Clinical Tuberculosis

Edited by BENJAMIN GOLDBERG, M.D., Associate Professor of Medicine, University of Illinois College of Medicine; formerly Director, Chicago Municipal Sanitarium. Philadelphia: F. A. Davis and Co. 1935. 2 vols. Pp. 1541. $22.

WITH the collaboration of 33 other contributors Dr. Goldberg has produced a monumental work. In a book of this composite nature the quality of the individual chapters is bound to vary and some repetitions and even a few contradictions are to be expected; but by allowing his contributors to speculate freely on hitherto unsolved problems, instead of only recapitulating well-attested facts, Dr. Goldberg has greatly added to the reader's interest, and his editorial supervision has been so wisely exercised as to give the book an individuality of its own.

Of the opening chapters in the section on pathology one of the most interesting is that on bacteriology by Dr. R. R. Mellon. He is an ardent believer in the new school, which no longer regards the tubercle bacillus as an unvarying entity, but as an organism possessing a life-cycle composed of several stages some of them non-acid fast and almost avirulent but capable of regaining virulence. The existence of gonidial reproductive forms, some of filter-passing dimensions, are also accepted. Dr. Mellon considers "allergy" a much overworked word and prefers to attribute the great variations in the clinical course of tuberculosis to the type of the infecting organism rather than to factors connected with the host. Further research will obviously be required before such views can be accepted. In the following chapter, on allergy and immunology, Dr. K. Robert Koch and Dr. Mellon give their opinion of B C G; they consider the crucial question here to be whether the human body will prove itself in course of time to be a suitable medium for the dissociation of the virulent from the avirulent type. Most present evidence is against this possibility, but animal experiments have not given categorical evidence for the efficacy of the culture as an immunising agent. The chapter on pathology by Dr. R. H. Jaffe, which follows orthodox lines, is clear and well illustrated. Mr. P. N. Coryllos contributes a stimulating chapter on pathological physiology; in this he discusses such questions as: Why are cavities spherical in the living and irregular in shape in the dead? What is the mechanism of their closure or occasional rapid increase in size? In answering them he shows himself to be in agreement with those who believe that many of these cavities contain air under pressure. Holding that the walls of cavities have already been studied thoroughly, he has directed his researches to their bronchial outlets which he considers to be the most important structures in the evolution of cavities. He finds that these draining bronchi always show some tuberculous lesions, varying from allergic œdema to caseous or productive changes. The lesions tend to produce stenosis of the bronchus, and a check valve mechanism may develop, allowing free ingress of air but not free egress, with the result that the cavity will increase in size. Complete bronchial obstruction will cause the cavity to shrink and disappear leaving an atelectatic portion of lung. Owing to the tubercle bacillus being a strict aerobe, requiring large amounts of oxygen for life and growth, closure of the draining bronchus should facilitate healing. Diminished oxygenation in the affected areas of a surgically collapsed lung is considered to offer a rational and physiological explanation for the good results of this treatment. The theories put forward by Mr. Coryllos receive confirmation in a subsequent chapter on classification in which Drs. Ornstein and Ulmar describe, with X ray illustrations, "check-valve" cavities which close and subsequently reopen. One of these chapters is of particular interest; a cavity was seen to close following a hæmoptysis, the blood clot obstructing the draining bronchus was expectorated and the cavity reopened. The section on diagnosis, besides describing the physical and laboratory methods in general use, includes a full and well-illustrated chapter on X ray findings by Dr. H. E. Potter.

In dealing with treatment, Dr. Goldberg shows a preference for well-ventilated rooms rather than open air. Patients frightened of the night air are assured that the only night air that is bad is the air of the night before. The importance of rest is well emphasised, all fresh cases being given a minimum of six weeks in bed however normal the temperature and pulse. Later on graduated exercise is preferred to excessive rest as the production of flabby, fattened patients must be avoided. In a chapter on salt-restricted diet Dr. E. Mayer quotes the experience of Gerson, Hermannsdorfer, and Sauerbruch, who consider that by this treatment allergy may be reduced. Although good results are claimed the method is not an easy one to carry out, and it is to be hoped that the much simpler method of Keining and Hopf who replace NaCl by an equilibrated salt containing K, Ca, and Mg will prove of equal therapeutic value. European readers will be surprised at the scant mention of gold therapy, which Dr. Goldberg dismissed in half a page. Evidently the unfavourable report of Ambersen, McMahon, and Pinner unduly discouraged further investigations of this remedy in America. Tuberculin treatment is only considered justifiable in localised, quiescent apical lesions.

A large section (368 pages) is allotted to collapse therapy. In this chapter on artificial pneumothorax Dr. R. C. Matson says the treatment is still not used sufficiently often or sufficiently early. He also emphasises the importance of abandoning an unselective collapse unless adhesions can be severed. When an adhesion is too vascular to be divided, coagulation by diathermy near its parietal attachment often results in satisfactory stretching with subsequent refills. Oleothorax is said to give good results in about 60 per cent. of selected cases of pyopneumothorax. When employed to prevent expansion of the lung the best results are obtained where the collapse is selective and the worst where compression is necessary. Phrenic neurectomy was only used in cases in which a pneumothorax had been attempted; in 52 per cent. of these so much improvement resulted that thoracoplasty was considered unnecessary. Selective surgical apical collapse is the subject of a further chapter by Mr. Coryllos, who concludes that the results so far obtained with apical thoracoplasties are by far the best of all methods of surgical collapse. Scalenotomy was not found to be effective in closing apical cavities, and after a review of the literature of apicolysis the conclusion is reached that if cases are properly followed up cures prove to be less than 20 per cent. In discussing total thoracoplasty Mr. C. A. Hedblom considers

the higher mortality found by some authorities with right-sided cases to be due to the effect of the one-stage operation on the heart. This operative mortality may be much reduced if the operation is performed in three or more stages. The chapter on tuberculous enterocolitis by Dr. Goldberg contains an illustrated description of the early radiological diagnosis of that condition following the work of Brown and Sampson. For the control of diarrhœa injections of calcium gluconate, at first daily, later weekly, are recommended. Tuberculosis and pregnancy is the subject of an interesting chapter by Dr. F. H. Falls, who believes that, contrary to former belief, pregnancy, labour, and the puerperium have little or no effect on the course of tuberculosis. In an instructive chapter on diabetes and tuberculosis Dr. R. W. Keeton points out that, whereas in non-diabetic adults only 3 to 5 per cent. present the acute broncho-pneumonic type of phthisis, the proportion is no less than 46 per cent. in diabetics who behave in this respect like primitive races in whom production of fibrous tissue is deficient. In the management of the diabetic tuberculous insulin, combined with a high carbohydrate diet, is advocated; feeding with glucose alone being necessary in the severely ill.

Every serious student of tuberculosis will appreciate this important book.

Kurz- und Ultrakurzwellen

Biologie und Therapie. By PAUL LIEBESNY, Leiter der Physikalisch-medizinischen Abteilung des Physiologischen Instituts im Allgemeinen Krankenhaus in Wien. Berlin: Urban and Schwarzenberg. 1935. Pp. 208. RM.8.50.

THE central matter of dispute among those at present interested in the biological and therapeutic effects of ultra-short waves is the question of specificity. Whether, that is to say, the oscillations merely produce their observed effects thermally, by virtue of the random molecular movements produced when they are absorbed, or whether there are specific effects, produced only by oscillations of certain frequencies, and unconnected with the accompanying heat evolution. Some see in ultra-short wave therapy only an extension, and in certain respects an improvement, of the more familiar diathermy; others, like d'Arsonval himself—the first investigator of the biological effects of the solenoidal field—believe that it is essentially a new therapy, involving specific effects often antagonistic to the thermal ones, and not to be explained even by the different *distribution* of heat produced by the two methods. Dr. Liebesny belongs to the latter group, and he holds the extreme view, very concisely stated in his preface, that ultra-short wave therapy must always be "athermal"—must always be carried out under such conditions that no appreciable temperature rise takes place.

Dr. Liebesny's book, then, is to be welcomed as a readable and fairly sober exposition of the various specific effects which are said to occur: in clinical practice, where no doubt anything can be proved, as well as in far simpler systems, where at least a rigorous experimental procedure can be followed—even if a perusal of these pages suggests that it has not in fact invariably been followed. Often, however, the methods used have been undeniably ingenious, not least so in the case of Dr. Liebesny's own investigations, which are here described in some detail. And it is worthy of mention that in some instances at least there is full theoretical support for the statement that certain observed effects could not conceivably be due solely to heat production—notably in the results of irradiation of micro-organisms.

So much for the central thesis of the book, with its extensive exposition of clinical and biological results. It should be added that the author does not exclude from consideration those applications, such as the production of artificial pyrexia, which are unquestionably due to heat production alone. As far as one can tell, the objectivity of his clinical protocols is never diminished by his adherence to a particular theory of the mechanism of short wave action.

Grundriss der Kurzwellentherapie

By Ing. Dr. WOLFGANG HOLZER, Assistent am Physiologischen Institut der Univeisität Wien; and Dr. EUGEN WEISSENBERG, Leiter der Kurzwellenstation an der Universitätsklinik für Nerven- und Geisteskranke in Wien. Vienna: Wilhelm Maudrich. 1935. Pp. 189. RM.8.

THIS book is divided into two parts, unequal in length and in quality. The first, by Holzer, gives a detailed account, which has all the virtues of scientific precision, of the physical and technical foundations of the production and action of ultra-short waves. The second, by Weissenberg, is a brief sketch of the present therapeutic application of these waves—extensive enough, however, to exhibit the difficulties with which clinical observation of this type has to cope.

Holzer introduces the reader to the physical aspect of the subject in a straightforward manner, without taking any special knowledge on the reader's side for granted, and yet without unduly repeating school-book information. After a simple account of the nature of oscillations, he presents with the utmost clarity the elementary properties of electrical circuits, the theory of electro-magnetic fields, and the electrical properties (specific resistance, dielectric constant) of biological material. Then the energy absorption of such materials, and its dependence on wave-length, is discussed, with an incidental discourse on the dipole theory of Debye. These preliminaries are followed by an entirely relevant review, in physical terms, of the question of specificity. The second chapter gives theoretical and practical details for the measurement of wave-length, absorption, and current intensity. The third chapter introduces short-wave technique: calculation of the constants of oscillatory circuits, advice for the construction of short wave generators and of accessories for experimental purposes. Finally, the mode of operation of powerful generators, and the precautions which have to be observed, are described. The bibliography is excellent, and in general this section of the book is to be recommended both for the originality of many of the technical details described and for the excellence of the diagrams.

Unfortunately the medical section of the book, a mere summary of the range of application of ultra-short waves, cannot be equally praised. The paragraph on the treatment of nervous diseases, in which Weissenberg is an expert, will be of interest to the specialist; the author insists on the potency of exceedingly small doses, a point on which he lays undue stress in his more recent publications. The reader will regret the omission of an adequate discussion of the experimental, physiological, and pathological basis of treatment, for which the author refers his readers to Schliephake's book.

Short Wave Therapy

By ERWIN SCHLIEPHAKE, M.D., Privatdozent for Internal Medicine at the University of Jena. Translation by R. KING BROWN, B.A., M.D., D.P.H. London: Actinic Press Ltd. 1935. Pp. 238. 21*s*.

THE ease with which ultra-short radio waves penetrate the body has established a place for valve generators of high-frequency oscillations in the armamentarium of the physiotherapist. This new agency is to be welcomed, since it utilises continuous waves of sinusoidal form at selected frequencies, whereas the older diathermy machine employs successive trains of damped waves involving at least two frequencies of varying form. Only by the utilisation of continuous waves of pure form can our knowledge of the mode of action of definite frequencies be analysed. Further, by the employment of very high frequencies, 20 to 100 million cycles per second, it is unnecessary to place the leading-in electrodes on the patient's skin, so that the ratio of deep to superficial treatment can be considerably increased. To accomplish this, use is made of the condenser field as suggested by Schereschewsky. Schliephake realised the immense possibilities of the application of the condenser field to the treatment of disease and he has earned the gratitude of physiotherapists for his clinical experiments both on himself as well as on patients. In his book, he presents his considered judgment on the use of ultra-short waves and the enthusiasm with which he tested out these very high frequencies on many different diseases maintains the reader's interest. His experience on the clinical uses of these short waves may well guide any who contemplate the acquisition of an ultra-short wave generator. Good generators are available in this country and some have the advantage over imported models that they possess a rectified high-tension supply instead of the raw alternating current which actually gives modulated waves. Schliephake's brief statement of the physical principles involved in the design of high-frequency oscillators is not presented with the same expert knowledge, but his account of biological experiments will serve as a useful guide to the further investigation of the action of very short waves.

Dr. King Brown's translation has appeared at an opportune moment since there are, as yet, no standard books on ultra-short wave therapy in English. He is to be complimented on producing it so quickly, but the translation would have been more readable if it were not so tied in its construction to the original of Schliephake. It is to be hoped that in any future edition greater freedom will be exercised so as to give the usual everyday phraseology of medical science. The bibliography has been curtailed which is unfortunate in so new a subject. A few misconceptions of a scientific character have arisen as a result of translation, but with this small reservation the book can be recommended as a good introduction to the subject.

Morbus Gallicus

A Bibliography of the Poem Syphilis Sive Morbus Gallicus by Girolamo Fracastoro of Verona. By LEONA BAUMGARTNER and JOHN F. FULTON. New Haven: Yale University Press; London: Humphrey Milford, Oxford University Press. 1935. Pp. 157. 22*s*. 6*d*.

THE reawakening of interest in Fracastoro's poem on the Morbus Gallicus has led to the issue of no fewer than four independent translations in English since 1928, and the revival is further emphasised by the publication of this exhaustive bibliography which includes all the 100 known editions of Fracastoro's unique work. The title of each of these is reproduced in a modified quasi-facsimile elaborated by copious and erudite notes on authors and printers, and descriptions of the known copies of the more interesting older editions. The beautiful illustrations of title- and text-pages add greatly to the attractions of this admirable example of specialised scholarship.

The Hair and Scalp

By AGNES SAVILL, M.A., M.D. Glasg., M.R.C.P.I., Consulting Physician, Fitzroy-square Skin Hospital; formerly Physician, St. John's Hospital for Skin Diseases. London: Edward Arnold and Co. 1935. Pp. 288. 12*s*. 6*d*.

THIS book will make a wide appeal to those concerned with the preservation of the natural state, and treatment of disorders of the scalp and hair. Although primarily influenced by the teachings of Sabouraud, Dr. Savill affords continual evidence of her own wide experience and powers of observation. She has provided much information not to be found in contemporary text-books of dermatology. An entirely new departure is a section on the molecular structure and elastic properties of hair, contributed by Mr. W. T. Astbury, lecturer on textile physics at Leeds university. This interesting if somewhat abstruse study has only lately been rendered possible by X ray photographs and their mathematical analysis. At the other end of the scale is the chapter on the care of the hair, which will enlighten the physician in the mysteries of the "permanent" wave, the nature and function of "setting" lotions, and the correct methods of combing and brushing. But it must not be thought that woman alone receives consideration.

The major portion of the book is devoted to diseases of the scalp and hair, and male baldness of the common type is discussed at length with copious allusions to the work of Sabouraud, and later authorities in Germany. This section deserves praise for the effort made to render the prognosis less gloomy than the facts, or rather their absence, have hitherto seemed to justify. A detailed account is given of alopecia areata, and here Dr. Savill might be charged with a measure of inconsistency. While she warns us that "the honest medical man knows that he has not greatly influenced the course of the disease" she proceeds to offer us no less than four closely packed pages of alternative treatment, in the course of which she appears to claim at least two cures in obstinate cases of the disease. Her chapter on hair dyes is excellent and should be read by all who practise the art, and even more by those who have, occasionally, to rectify the results. One is glad to note that yet another author condemns the use of X rays in the treatment of hypertrichosis. A short appendix contains formulæ frequently required in the treatment of pityriasis, psoriasis, greasy hair, and so forth. Some of these are prescribed according to the metric system, others in the vernacular style, while a third set seems to need translation from the French. These small inconsistencies will doubtless be abolished in a future edition.

Dr. Savill is to be congratulated on a sound and informative work.

THE LANCET

LONDON: SATURDAY, NOVEMBER 16, 1935

THE CATHARTIC FUNCTION OF GENERAL ELECTIONS

MANY people who find in their work or their hobbies a satisfying outlet for their energies regard politics, and particularly general elections, as a nuisance and an interruption of the smooth and orderly run of life. They are apt to refer to them as recurring emotional crises, on the assumption presumably that political life should be conducted solely by reason in a dispassionate spirit. Observation shows that frequently those who are led by temperament to this opinion, when they do go to the polls, commonly use their opportunity to protest *against* something rather than to vote for something else. It is not easy to be dispassionate and at the same time reasonable about politics. When political science was speculative it was thought that men were by nature free, equal, and independent, and that they divested themselves of their natural liberties and put on the bonds of civil society by making an implicit agreement or social contract. If this were true the function of politics would indeed be reasonable, and Parliament would resemble a court of arbitration between the sovereign power and the people. Such is the sober wish of those non-political people to whom reference has been made, but they share the illusion of a past age. The modern trend of thought in political science is to look in another direction for a key to the understanding of the riddle of man's spasmodic interest in politics, or his dislike of it. It is obviously a far more complicated thing than any social contract, or, if we turn to biology, than the stable associations of bees or beavers, or the periodic herding of animals under the urgency of instinct.

The researches of modern psychology assist us here; they show that the great need for social life is due to the long period of dependence which characterises the young of the human species, and to the plasticity of the emotional life at that time. The desire to be a part of the community is implanted so deeply that the person who is utterly indifferent to the claims of the group is generally regarded as abnormal. The tie with society is not a contract, as LOCKE, BECCARIA, and ROUSSEAU taught, nor an expression of reflex obedience to instinct, but is highly charged with emotions of all kinds. A further complication lies in the fact that man displaces on to society many of his personal desires and ambitions. Something more than an aggregate of strength results from the formation of a group—viz., an outlook on the future. This outlook is not a forecast based on careful observation and inference, but is a resultant of the hopes and despairs of those who form the group. Modern psychology asserts that the hopes and desires which mainly influence the electorate are not conscious ones, but are reactions which go on beneath the surface of the mind and are not influenced by reason. In his political life man responds to his personal disappointments by an attack on the Government, which represents society, and places his trust in a new and sometimes untried body of men, because he hopes from the unknown something better than the past has been able to achieve. Politics provides an outlet for pent-up personal emotions, and is a kind of safety-valve which tends to keep down the pressure of the disruptive forces.

There are great advantages as well as grave dangers in this mechanism for the de-tensioning of the mind. It leads men to the highest altruism, when they are swayed by hope and generosity; but in another mood they will ruthlessly destroy the very object they had the moment before revered. While men have these explosive and unstable unconscious emotional forces within them, the psychologists tell us, politics will be subject to violent oscillation, and there will always be a danger of internal disruption; but the danger is diminished if there is a way of making the outlet adequate. In England this is achieved by a peculiar political device: the part of the emotional life of the individual that is concerned with politics is split into two, one portion is reserved for the Crown and all that it implies, the other for the Cabinet. Discontent, however active, does not destroy the whole of the sovereign power but only a replaceable portion of it. The Government can be turned out without disrespect to the Crown. Loyalty and anti-government feeling unite in cabinet making and in cabinet breaking. But the throne is safe so long as the Cabinet is felt to be worth attacking; the aggressive feeling is real and will not be satisfied with the figment of a Cabinet.

Apart from all its merits in providing an executive organ of government, our constitution affords a good remedy against the dangers of the accumulating discontent, which leads to revolution, by providing an efficient cathartic in the form of general elections.

PARENTERAL LIVER IN THE TREATMENT OF SPRUE

WE are laboriously learning something of how the different types of deficiency disease are brought about. The ætiological mechanisms involved in their production are gradually becoming disentangled and their exact relations in various morbid states are being determined. In the process a close relationship, already suspected on clinical grounds, between certain disease entities has been confirmed. For example, a recent detailed investigation of tropical sprue in Porto Rico by Dr. W. B. CASTLE and

three collaborators once again corroborates the many points of similarity between sprue, pernicious anæmia, and pellagra.[1] Indeed it was beyond their clinical ability to decide whether certain of the patients under observation were suffering from sprue or pernicious anæmia. They go so far as to state definitely that they can establish no distinction between the character of the blood picture found in the two conditions, whereas so experienced an observer as N. HAMILTON FAIRLEY[2] was able to find one. They do not appear to have discovered among their cases of sprue any evidence of the disturbance of calcium metabolism which is so constantly present in idiopathic steatorrhœa, a disorder which THAYSEN[3] maintains to be identical with tropical sprue. They conclude that in sprue as in pernicious anæmia there is involved the failure of a reaction between an extrinsic factor in the diet, associated in several substances with vitamin B_2, and an intrinsic factor, present in the gastric contents of the normal person. This failure of reaction may be attributable to lack of extrinsic factor due to deficient diet, or to lack of intrinsic factor due to failure of gastric secretion. In addition, difficulty in the absorption of hæmopoietic factors from the alimentary canal is also present in some patients. A formidable amount of experimental evidence is marshalled to support this view. Analysis of the diets of the patients investigated showed them to be distinctly deficient in sources of extrinsic factor—namely, meat, eggs, and whole cereals. In many patients a lack of power on the part of the stomach to secrete intrinsic factor was demonstrated; in others, no reaction to the oral administration of liver extract was obtained though parenteral therapy was successful, pointing to a failure of intestinal absorption.

CASTLE and his fellow workers suggest, since the administration of defective diets to animals may produce not only a megalocytic anæmia but also profound morphological and physiological derangements of the alimentary tract, that the same may hold true in sprue and in pernicious anæmia. A deficiency of the extrinsic factor or some related substance may originally be responsible for diminishing the intrinsic factor secreted by the stomach or for producing other degenerative changes leading to intestinal impermeability. The original effect of a deficient diet would therefore subsequently be enhanced by the development of failure in alimentary secretion. In this study of sprue the possible influence of deficient diet is made obvious; in pernicious anæmia, however, apart from rare cases following operative interference, the mechanism leading to a disappearance of intrinsic factor is still not clear. Further, if this attractive hypothesis is correct, it is difficult to understand why a hypochromic rather than a hyperchromic anæmia develops in certain other anæmias where a somewhat similar dietary deficiency has been shown to be of extreme ætiological importance, as, for instance, in the anæmia associated with hookworm infestation[4] and in idiopathic hypochromic anæmia.[5] The possible influence of diet on gastric function, and therefore indirectly on hæmopoiesis, may possibly prove as significant as its more direct and obvious effect, but clearly requires further investigation. Beyond dispute, anyhow, is the value of adequate dosage of liver extract, preferably given by the parenteral route, in the treatment both of the intestinal and hæmopoietic disorders of sprue. Larger doses are often required in sprue than in Addisonian pernicious anæmia, and even then the response of both reticulocytes and red cells is rather less in the former than in the latter. But CASTLE and his fellow workers believe that in every patient not proved to have a complicating infection both intestinal and hæmopoietic improvement follows the administration of parenteral liver in adequate dosage, if necessary with the addition of iron, without the use of any special diet. These views on treatment conflict with those of FAIRLEY,[6] who not only insists upon the necessity of giving a high protein diet to all patients with sprue but is also inclined to consider oral preparations of more value than parenteral ones. But the observations from Boston are so well controlled and detailed as to suggest that provided adequate amounts of a known potent liver preparation are given, the prognosis for a patient with sprue is as good as that for a patient with pernicious anæmia irrespective of dietetic treatment.

[1] Castle, W. B., Rhoads, C. P., Lawson, H. A., and Payne, G. C.: Arch. Internal Med., 1935, lvi., 628.
[2] Trans. Soc. Trop. Med. Hyg., 1930, xxiv., 131.
[3] Quart. Jour. Med., October, 1935, p. 359.
[4] Rhoads, C. P., Castle, W. B., Payne, G. C., and Lawson, H. A.: Medicine, 1934, xiii., 317.
[5] Davidson, L. S. P., Fullerton, H. W., and Campbell, R. M.: Brit. Med. Jour., August 3rd, 1935, p. 195.
[6] Trans. Soc. Trop. Med. Hyg., 1934, xxvii., 545.

"SURGEON"

WHAT is a "surgeon"? Has any untrained person the legal right to call himself a surgeon or does the word exclusively connote a duly qualified practitioner? The Medical Act of 1858 (as no registered surgeon needs to be reminded) was passed for the express purpose of enabling the public to discriminate between the qualified and the unqualified. With this purpose in view Section 40 protects several professional descriptions, one of which is "surgeon." Yet this title, which was meant to be the badge of duly qualified professional men, has been usurped by the unqualified. The latter indeed are claiming that a successful usurpation, lasting over the past 20 years or more, gives them a species of prescriptive right to-day. They prefix some such adjective as "osteopathic" or "manipulative" to the noun "surgeon" and declare that this hyphenation keeps them on the safe side of the prohibition in Section 40. This dubious position is due to the fact that the language of the statute is less clear than its purpose. A certain obscurity, partly accounted for by inadequate reporting, has clouded some of the decisions by which the section has been interpreted. But the clouds are being dispelled. In Whitwell *v.* Shakesby[7] a defendant who labelled himself

[7] THE LANCET, 1932, i., 1112.

"bonesetter, osteopathic physician and surgeon" was held to have infringed the statutory prohibition. And now in Jutson *v.* Barrow [8] a defendant who labelled himself "manipulative surgeon" has met the same fate. Captain BARROW stated in the witness-box that he selected the adjective "manipulative" for the very purpose of directing attention to the fact that he was not a duly qualified surgeon within the meaning of the Medical Act. If any other name would properly describe his work, he would gladly adopt it. The Lord Chief Justice was evidently unimpressed by these protestations. Lord HEWART thought there were plenty of other descriptions—"bonesetter," for instance, or "manipulative healer"—which would achieve Captain Barrow's object. Why did unqualified men select the word "surgeon"? Was it not because of its well-known and particular connotation and association? The thing which makes the name "surgeon" appear to be attractive and useful to them, concluded Lord Hewart, is precisely the thing which Section 40 was enacted to prevent; "if this gentleman is, as we must take him to be, sincere, there are many ways of telling the public that he is not a surgeon other than the way of telling the public that he is a surgeon."

In Jutson *v.* Barrow Mr. NORMAN BIRKETT, K.C., appearing for Capt. Barrow, seems to have conceded that the use of the word "surgeon" by itself would imply that the person who used it was a registered surgeon under the Medical Act. Mr. Birkett, arguing that the addition of an adjective can change the meaning of the noun, sought to find analogies in the names "dental surgeon" and "veterinary surgeon." These names have, of course, their own statutory significance and protection. Lord Hewart would not allow any such magic to the epithet "manipulative." Every surgeon works with his hands; "to say that he is a 'manipulative surgeon' is as if it were to say he is a 'surgeon surgeon.'" At the end of the case the Lord Chief Justice added his own personal opinion that it was hard to imagine any adjective which, being added to the title "surgeon," would excuse the use of the word "surgeon" by a person not registered or recognised under the Act of 1858. Such observations clarify the legal position. The Medical Act surely intended that an offence against Section 40 would be established if it were proved first that someone had intentionally described himself as a "surgeon" and secondly that his name was not to be found on the Medical Register.

The recent decisions seem to show that this intention is being realised. "In the present case," said Lord Hewart in Jutson *v.* Barrow, "the only fact which needed to be found was: did this man call himself a surgeon?" Capt. Barrow was admittedly not registered under the Medical Act; he did not hold, and had never held, any medical degree. The obscure phrase "wilfully and falsely," which occurs in Section 40, does not require that the defendant must be proved to have acted with intent to deceive. Nobody suggests that Capt. Barrow had any fraudulent intent. The Medical Act does not prevent him from practising; it merely stipulates that he should not confuse the public mind by using titles which the Act reserved for the use of duly qualified practitioners. The scheme of the "Council of Physical Medicine" may be mentioned in this connexion. It proposed to institute a Register for all practitioners of the healing art who are not already registered under the Medical Acts. It would admit to this Register all existing "osteopaths, chiropractors, naturopaths, manipulative surgeons, botano-therapists, herbalists, and radiologists," and for a fee of seven guineas it would grant each registered member a certificate "which will entitle the holder to be described as a Doctor of Physical Medicine and to use the initials of D.Ph.M." Is not this just the point which Lord Hewart has been criticising? "Doctor of Medicine" is, like "surgeon," one of the well-known professional descriptions which Section 40 of the Medical Act reserves for the duly qualified practitioner. "Doctor of physical medicine" seems to bear much the same relation to "doctor of medicine" as "manipulative surgeon" bears to "surgeon."

[8] Ibid., Nov. 2nd, 1935, p. 1023.

EPIDEMIOLOGY OF AN ISLAND

THE issue of a report on the public health in Iceland in the year 1933 allows some interesting comparisons to be made between the vital statistics of this little and relatively isolated community, mainly devoted to a pastoral and fishing life, and those of our own highly urbanised population for which the Registrar-General has recently issued the statistics of 1934.[1] Iceland has not been free from the world-wide economic depression and unemployment has been extensive. In spite of this the death-rate and infant mortality-rate have both been very low. The latter was in 1933 only 43 per 1000 live births, well below the 59 recorded in England and Wales in the following year. In Iceland, according to the reports of midwives, 85 per cent. of the infants born in the year were breast-fed, 5 per cent. partially breast-fed, and only 10 per cent. bottle-fed. It would be interesting to have comparable figures for this country. The stillbirth-rate of Iceland is also remarkably low, being only 21 per 1000 births, whereas in England and Wales its level since notification became compulsory has varied very little from 40 per 1000. The maternal mortality experience of the smaller country is also very favourable, the rate being 2·8 per 1000 live births in 1933 compared with 4·4 in England and Wales in 1934—though certification and grouping of the cause of death may complicate the comparison.

On the other hand, to the disadvantage of the rural community is its mortality from tuberculosis. The crude death-rate from all forms of tuberculosis, 1·5 per 1000 inhabitants, is nearly twice the rate in England and Wales, and in 1933 accounted for 15 per cent. of all deaths compared with only about

[1] See THE LANCET, Nov. 2nd, 1935, p. 1034.

7 per cent. in this country. For a proper assessment of the difference standardised rates, or rates at ages, are necessary, but are lacking from the Iceland report. It is possible that the advantages of rural environment are severely offset by a lower standard of living. To check the spread of the disease a systematic search has been planned for carriers of tubercle bacilli and sources of infection. An initial investigation by S. SIGURDSSON in a little fishing village is reported. Here there had been a considerable spread of tuberculosis in recent years, imported, the evidence suggests, by immigrants from other parts. Pirquet tests were made on all the 77 children (aged 1–16) in the village; the 14 (or 18 per cent.) positives lived at the houses of the infection carriers or in their vicinity. Amongst 160 persons clinically examined two carriers of infection were found and it is concluded that these should be removed to a sanatorium, a strict eye kept on the Pirquet-positive children, and those at present negative re tested annually to determine when and where they acquire infection. In some schools of the country a daily dose of cod-liver oil is administered, and this practice is growing. It will be interesting to see what effect this has upon the general level of health and the incidence of infectious diseases. Judging by the notifications some of the common infectious diseases of childhood disappear, rather surprisingly, for a year or two. For example, in 1924 3802 cases of measles were registered, in 1927 only 1, in 1929 a further 3026, in 1930 and 1933 none at all. Similarly there were no notifications of whooping-cough throughout 1932 and 1933, but over 6000 in 1927. Over the ten years 1924–33 the annual number of cases of mumps ranges from 0 to 1858, of German measles from 4 to 449, of scarlet fever from 5 to 624, of acute poliomyelitis from 2 to 463. Chicken-pox appears to be more constant, never falling below a hundred cases and only twice exceeding two hundred.

Some six years ago we suggested that the island[2] should prove a fruitful field for epidemiological investigations. The present interesting vital statistics confirm this opinion. For example, the figures suggest that diseases such as measles, whooping-cough, and mumps are unable to attain a permanent endemicity in Iceland, and epidemics are therefore limited by the exhaustion of all the available susceptibles and do not reappear till the disease is reintroduced from outside the island. It should not be difficult to collect data to prove or refute this suggestion. Again, although in the past Iceland has been decimated by small-pox, yet no case has been reported for many years. Vaccination is compulsory in the island. It would therefore be interesting to try and discover if the complete freedom from small-pox is due to vaccination or to the isolated position of the country. Few purely epidemiological investigations have been undertaken in Iceland, apart from NIELS DUNGAL'S interesting observations[3] on Schick immunity. DUNGAL found that in 1931 the Schick immunity of the children in the island was low, and did not rise significantly with age until they were thirteen, when the percentage of Schick-immunes rose suddenly from 17 per cent. at twelve years to 38 per cent. at fourteen years of age. Unfortunately the latter was the oldest age-group tested. This sudden step in immunity can be attributed to an outbreak of diphtheria which occurred ten years previously in 1921 and immunised the children who were over twelve years of age in 1931. On the other hand, those who oppose the latent-immunisation theory could equally well attribute this peculiar step up in immunity at the age of twelve to fourteen to a natural genetic growth process associated with the onset of puberty. The population of Iceland is about 112,000—which is half the strength of our Regular Army. This is a small enough community to allow a team of research workers, in liaison with the public health authorities, to undertake a complete epidemiological survey of the population. It should be possible to collect and record the medical history of every individual from birth to death, and to map out in space and time every case of disease. The whole population could be tested at suitable intervals with tuberculin, hydatid antigen, Schick toxin, and any other reagents. It could also be blood grouped. The distribution, movements, and changes in the bacteriological flora of man and his domestic animals could be followed in adequate samples of the population. By such means it should be possible, at a relatively small cost, to obtain for the first time a more complete ecological picture of the host-parasite relationships in a natural self-contained human community than would be practicable in any larger or less isolated natural group of human beings. We would therefore reiterate what we said in 1929: at the present moment there is in Iceland an opportunity, which will never occur again under modern world conditions, of obtaining epidemiological data of unique value.

[2] Ibid., 1929, ii., 783.
[3] Brit. Jour. Exper. Path., 1932, xiii., 360.

THE next session of the General Medical Council will open on Tuesday, Nov. 26th, at 2 P.M., when Sir Norman Walker, the president, will take the chair and deliver an address. The Council will sit thereafter from day to day until their business is concluded.

THE tenth congress of the International Society of Surgery will be held, as arranged, in Egypt from Dec. 31st to Jan. 4th. The secretary-general is Dr. L. Mayer, 72 rue de la Loi, Brussels.

ON Wednesday, Nov. 20th, at 8.30 P.M., Fellows of the Royal Society of Medicine and their friends will be received by Dr. Robert Hutchison, the president, and Mrs. Hutchison. At 9.15 Sir Richard Paget will give an address on "How and why we speak." Admission will be by ticket only.

ON Nov. 28th Dr. Magarinos Torres, chief of laboratory of the Oswaldo Cruz Institute in Rio de Janeiro, will deliver a Lloyd Roberts lecture before the tropical diseases section of the Royal Society of Medicine. His title will be Further Studies on the Pathology of Alastrim and their Significance in the Variola-Alastrim Problem.

ANNOTATIONS

THE JEWISH DOCTOR IN GERMANY

A MOVING article communicated to the *Times* on Nov. 8th by a well-informed correspondent describes the increasing intensity in Germany of Jewish persecution, and shows how the encouragement given to this mass cruelty is affording chances to the anonymous informer and the blackmailer. Jewish doctors may not be more specially victimised than the Jews of any other occupation or vocation, but the doctor is particularly open to such assaults, and among the cases selected for notice by the *Times* correspondent as examples of extra-legal Jewish persecution there are certain which illustrate how vulnerable the Jewish doctor must be to the malice of fanatics, and what an easy way to pecuniary profit for the "Aryan" practitioner an agitation can be against a successful Jewish colleague. It would appear to be the intention of Nazi organisation that the Jewish doctor should be forced out of the practice of his profession in Germany. In the majority of cases the money that he may be able to take out of the country must be small, as the result of forced sales; and out of Germany he will find the opportunities for medical practice few and precarious. Hence to many German doctors the difficulty of emigration will be such that there will appear to be no alternative to slow starvation, and this among the communities where their skill and their humanity had won them regard. We cannot doubt that the great majority of our colleagues in Germany view the state of affairs with the same feelings as we experience in England. They know as well as we do that the common object of the art and science of medicine is the welfare of all men, without distinction of race or creed. We extend to them, as well as to the victims of direct persecution, our sympathy and the expression of a hope that even now this great evil may be stayed.

A NEW COLLAPSE OPERATION

IT might be thought that the labours of so many clinicians over more than forty years had exhausted the possibilities of collapse operations. During this time the technique of artificial pneumothorax has changed from an elaborate operation carried out with cumbersome apparatus by a specialist in a special clinic to a simple procedure performed by the dispensary doctor. The invention of the thoracoscope has made it possible to arrest disease in many cases where persistent adhesions between lung and chest wall prevent collapse of the tuberculous focus. The introduction of paravertebral thoracoplasty has converted a hazardous operation, carried out as a last resort in desperate cases, into a procedure with a low immediate mortality which has restored many victims of chronic phthisis to a state of economic as well as physical security. Of recent years disease limited to both upper lobes has been cured by excision of the upper ribs on each side. And, despite its drawbacks, plombage has saved some patients from that most distressing end—fatal secondary hæmorrhage from a tuberculous ulcer in the lung. So far all types of thoracoplasty have followed the lines originally laid down by Spengler and Turban, and in all the operations care has been taken to excise the posterior ends of the ribs, until two years ago Monaldi began to operate on different principles. Ventilation of the lower lobe of the lung, as Keith has pointed out, is carried out by the diaphragm; ventilation of the upper lobe by movements of the upper six ribs. Monaldi ensures rest of the lower lobe by interruption of the phrenic nerve, while ventilation of the upper lobe is suspended by excision of the antero-lateral segments of the upper six or seven ribs. In a recent account[1] of Monaldi's work, E. Berthet explains the principles involved and points out that not only is immobilisation of the diseased lung obtained but opportunity is given for the retraction and healing of recent cavities in the upper and middle zones of the lung. There is further the great advantage that the operation is in itself of less severity than paravertebral resection, as the ribs are more readily exposed, and when bone regeneration is complete the patient is again in possession of a functioning chest wall. The operation resembles the induction of an artificial pneumothorax in so far as it is not an irrevocable step. Despite the interest which this proposal will naturally excite, emphasis must be laid on its limited indications. The lesion must be in the middle or upper zone of the lung, artificial pneumothorax must be impracticable, and the disease must be of comparatively recent standing. Chronic cavities with thick fibrous walls cannot be influenced except by one of the standard operations. It is clear that the selection of cases suitable for the Monaldi operation must be left, at least for the present, in the hands of those with special experience.

ACTIVE IMMUNISATION AGAINST POLIOMYELITIS

A FEW months ago we drew attention[2] to certain efforts to devise methods of specific prophylaxis against poliomyelitis. Mention was made of the vaccines of Brodie and of Kolmer and of the results obtained with the latter preparation in immunising 25 children. It will be recalled that Brodie's vaccine consisted of virus which had been rendered inactive by formalin, whereas Kolmer's contained active virus attenuated to some extent by treatment with sodium ricinoleate. At the time our leading article was written details of Brodie's work were not available, but the publication of a paper read by M. Brodie and W. H. Park[3] at the eighty-sixth annual session of the American Medical Association has made good this deficiency. In this communication the authors refer first of all to the preliminary experiments on monkeys which led them to choose a formolised vaccine in preference to others. The use of subinfective doses of live virus or of serum-virus mixtures was abandoned, because the former method carried with it the risk of infection, and the serum-virus mixtures, to be effective, had to be so nicely balanced as to make preparation on a large scale impracticable. Inactivation with formalin was found to give a safe and effective preparation, and they finally decided on virus treated with 0·1 per cent. formalin for 8–12 hours at 37° C. As evidence of the safety of their vaccine they refer not only to their experiments on monkeys, but to the immunisation of over 2300 children without mishap. In a certain number of children the development of neutralising antibody in response to the vaccine was determined. For obvious reasons these investigations were on a limited scale, but they served to indicate that one inoculation of 5 c.cm. of vaccine produced appreciable antibody in three-quarters of the children, whilst

[1] Presse méd., Oct. 5th, 1935, p. 1558.
[2] THE LANCET, 1935, i, 686.
[3] Jour. Amer. Med. Assoc., Oct. 5th, 1935, p. 1089.

two doses evoked antibody in almost all of them. And the titre of antibody in vaccinated children compared favourably with that of children convalescent from poliomyelitis. There seems little doubt that Brodie's vaccine can be administered to children without risk and that vaccinated children develop specific antibody. One may question, though, whether these children have acquired a reasonable and durable degree of resistance to infection. Experience with other viruses has shown that formolised vaccines give only a low-grade immunity which does not last for long, and there is no reason why poliomyelitis virus should prove an exception. This is evidently the opinion of T. M. Rivers,[3] for at a recent meeting of the American Public Health Association, reported in our last issue, he questioned the efficacy of Brodie's vaccine, which has now, it appears, been given to 8000 persons. He further stated that Kolmer's vaccine was unsafe since it contained active virus. Kolmer has vaccinated more than 400 children by his method in Philadelphia during the past year with, as he says, absolutely no ill-effect, and the distribution of vaccine is being proceeded with. Nevertheless the use of a vaccine containing virus so slightly attenuated does not seem to us devoid of risk and we would suggest that a safer procedure would probably be a combination of the two methods on the lines of Laidlaw's prophylactic inoculation against distemper. A primary inoculation of formolised virus would give sufficient immunity to allow of the administration of the living attenuated virus with a greater degree of security. However, both Brodie's and Kolmer's vaccines are evidently being given to children on a large scale, and no doubt these field experiments will tell us whether either of these methods is both effective and safe.

CRUCIATE LIGAMENTS OF THE KNEE

A FEW weeks ago we commented on a paper [4] in which Milch advanced the view that the cruciate ligaments, despite their stout build and firm attachment, have little functional value. As we suggested at the time, opinions differ about the relative importance of the capsular (especially the collateral) ligaments and of the cruciate. Leemans,[5] of La Hestre, Belgium, from experiments on the cadaver concludes that the anterior cruciate ligament does in fact come into play sooner than the capsular ligaments in limiting anterior gliding movements of the tibia on the femur. He found that in a knee-joint with the cruciate ligaments intact and the capsule removed, anterior gliding of the tibia was arrested after a movement of 6 mm.; whereas in the reverse experiment, with the cruciate ligaments removed and the capsular remaining, 10 mm. of forward movement was permitted. The difference in posterior movements was insignificant, amounting to 2 mm. only. Leemans agrees with Milch that in extension the stability of the joint depends on the action of the collateral ligaments and the posterior oblique popliteal ligament, aided by the tonic contraction of the quadriceps femoris. It is in flexion alone that the cruciate ligaments become tense; and it is in this position therefore that they must be ruptured. In the ordinary use of the limb the cruciate ligaments appear to serve no useful purpose; can it be that their presence is a relic of the stage of incomplete assumption of the erect posture? Walking with the knee partly bent seems to call for a type of mechanical stability different from walking with the knee extended, and with the quadriceps acting at its full advantage. Hence, possibly, the vulnerability of the cruciate ligaments in ski-ing.

[3] Annotation, ibid., Oct. 19th, p. 1275.
[4] Arch. of Surg., 1935, xxx., 805; see THE LANCET, August 17th, 1935, p. 384.
[5] Presse méd., Sept. 11th, 1935, p. 1409.

HEALTH INSURANCE THROUGH AMERICAN EYES

THE *New England Journal of Medicine* of Oct. 10th, 1935, contains an unsigned article, published apparently on behalf of the Public Relations Committee of the Massachusetts Medical Society, which illustrates the misconceptions of the English health insurance system that are prevalent among American doctors at the present time. The writer regards health insurance as a product of modern industrialism, which has failed "to provide sufficient wealth for every willing worker to care comfortably for himself and his family in their essential needs," and he seems to be unaware that, through the friendly societies and the mediæval guilds, health insurance has a long history as an expression of man's need for mutual aid, and that compulsory health insurance was advocated by Daniel Defoe as far back as the seventeenth century. In his account of how the English system began the writer makes an original contribution to history. It began, he says, owing to Mr. Lloyd George's fear in 1911 that he might lose "his control of the British Government" and be squeezed out of politics:—

> "Then one night he sat up late reading German history, as a relaxation from the arduous labours of the day. He learned of a German statesman who several years before finding himself in much the same position hit upon the expedient of compulsory sickness insurance as a means of demonstrating his interest in and sympathy for the labouring man. He closed the book and went to bed. The German history had solved his problem and thus was born England's compulsory sickness insurance idea."

With such beginnings it is not surprising to learn that compulsory health insurance has everywhere been controlled by "an institution that appears to be the same the world over, the institution of politics." The writer doubts that the English approved societies are really non-profit making organisations; he assumes, without giving evidence for the assumption, that—

> "actually costs are so manipulated that a very tidy profit is realised. Those of us who have had any contractual contacts are familiar with costs plus plans. We know how these costs may be and are juggled, and we furthermore know that from these same costs come plenty of gravy."

In describing the English system the writer falls into other curious errors. For example, a doctor wishing to undertake insurance practice must inform the Ministry of Health accordingly; maternity benefit is a payment of £1, which is paid to the husband; the expenses of a panel practice amount to £220, and so, since the average gross income from panel practice is £392, the net income is only £172. Insurance doctoring is therefore "cheap service, and at best second-class service. This is true not only in England and Germany, but in all countries harbouring systems of compulsory sickness insurance and nobody seriously questions this fact." If the writer had read the article contributed to the same journal on April 12th, 1934, by Sir Henry Brackenbury he would have seen the allegation of inferior service very seriously questioned, and indeed confuted, by one having unequalled authority to speak on the subject. The writer concludes that the introduction of compulsory health

insurance into the United States should be resisted by American doctors. With our experience we feel there may be worthier antagonists.

QUININE AS A CONTRACEPTIVE

DURING the past half-century quinine has probably been more widely used than any other drug for contraceptive purposes; yet it has grave disadvantages in comparison with some other substances. In the first place even the soluble quinine salts are relatively poor spermicides (J. R. Baker [1] has found several substances which are as much as 256 times as spermicidal as quinine bisulphate) and their efficiency is apparently further reduced by the vehicles in which they are usually incorporated as suppositories. Of greater significance however than this are the local and remote effects which quinine salts may have on a small proportion of the individuals using them as contraceptives. Some of these are noted by C. Booysen in a recent issue of *Marriage Hygiene*.[2] The local effects observed range in severity from a complaint of local irritation to an acute vaginitis with ulceration. These clinical findings are supported by the experimental work of H. M. Carleton and H. Florey [3] who found that an intense vaginitis was produced in bitches by the daily introduction of quinine and urea hydrochloride into the vagina. That many substances may be absorbed from the vagina is now well established and has been proved experimentally by D. I. Macht [4] and G. D. Robinson [5] among others; and there seems to be no lack of clinical evidence that quinine in various forms placed in the vagina may cause severe toxic symptoms in women sensitive to the drug. Booysen quotes an interesting case reported by W. K. Ford [6] of a male patient who developed vesicular dermatitis of the scalp, face, and neck after the application of a hair tonic. Skin tests of the ingredients of the lotion proved that quinine sulphate was the cause. A few months later, following the use by his wife of a vaginal suppository containing quinine bisulphate, he developed an œdematous vesicular dermatitis involving the penis, scrotum, eyes, cheeks, ears, and neck. These idiosyncrasies may be rare, but now that substances are available, which are not only more spermicidal but also free from any harmful local and remote effects on the users, it would seem that the time had come to abandon the use of quinine for contraceptive purposes.

THE AFTERMATH OF INJURIES

THERE is now a growing feeling that the present arrangements for dealing with injuries are wasteful and inefficient, and that much of the resulting disability is avoidable. The subject has been ventilated freely in this country during the past year. In January Dr. H. H. Kessler, of Newark, gave addresses in London on the New Jersey Rehabilitation Commission, founded in 1919 to provide medical examination, treatment, training, and placement in industry of disabled persons, including a large proportion of workmen, and a few weeks later a film was shown under the auspices of the Fellowship of Medicine, in which the work of this commission was illustrated. Two books bearing closely on the subject have since appeared; one by Dr. Kessler himself gives a detailed survey of the arrangements now in force in all the principal countries of the world for dealing with different classes of physically handicapped persons, and the other by Mr. H. E. Griffiths contains an analysis of 50,000 consecutive cases of injury giving rise to claims under the Workmen's Compensation Acts, with some constructive suggestions. The report on the treatment of fractures, published by a special committee of the British Medical Association, has focused public attention on the deplorable results so often observed in this class of injury. This was manifest at the conference, reported on another page, where the problem of physical disability was discussed from many angles by representatives of hospitals, public health authorities, insurance companies, trade unions, and others.

It is clear that the solution of the complex questions involved cannot be attained except by the close coöperation of many different sections of the community, some of which show mutual misunderstanding and even hostility. It is common, for instance, to hear that the interests of trade unions are in conflict with those of insurance companies; that serious differences of opinion are expressed by doctors whose evidence is sought on behalf of injured persons and on behalf of employers by insurance companies; and that lawyers, doctors, and others concerned in the settlement of claims for injury tend to become absorbed in their own particular aspect of the subject and to neglect the interests of the patient. Many criticise the working of the laws, and especially of the Workmen's Compensation Acts, which are said to have become so elaborate that justice is often completely lost sight of in a jungle of technicalities. Much of the criticism is of course ill-founded. A satisfactory feature is that labour organisations are apparently out not merely to obtain adequate compensation for injuries to their members, but to establish a procedure founded on equitable principles. The Labour Party has introduced a Bill to establish a system of dealing with workmen's compensation claims on the lines practised in the State of Ontario for the past 20 years, and since adopted in principle in many of the United States of America and elsewhere. Under this scheme costs have been reduced to about 2 per cent. of the funds available (as compared with nearly 40 per cent. in this country) and the proceedings—which are conducted without the aid of lawyers and outside the courts—offer much greater advantages to the workman than are possible under our present arrangements. In spite of allegations to the contrary made during the discussion last week (see p. 1117), insurance of risks under the Workmen's Compensation and Employers' Liability Acts does not seem to be very profitable in this country. Figures published in the *Post Magazine and Insurance Monitor* for Dec. 8th, 1934, showed that about a third of the companies undertaking this business showed either no profit at all or an actual loss, and that the average profit, after allowing for expenses, was only 4½ per cent.; it was highest in the tariff companies (5·9 per cent.) and lowest in the mutual companies (0·6 per cent.).

In opening the conference on the welfare of cripples and invalid children Sir Kingsley Wood, Minister of Health, announced that the whole matter of the present arrangements for dealing with accidents and claims for injury is about to be considered by an interdepartmental committee of the Ministry of Health and the Home Office, with the following terms of reference:

To inquire into the arrangements at present in operation with a view to the restoration of the working capacity

[1] Journal of Hygiene, 1932, xxxii., 181.
[2] Marriage Hygiene, 1935, ii., 54.
[3] Jour. Obst. and Gyn. Brit. Emp., 1931, xxxviii., 555.
[4] Jour. of Pharm. and Exp. Therapeutics, 1928, xxxiv., 137.
[5] Ibid., 1927, xxxii., 81.
[6] Jour. Amer. Med. Assoc., 1934, ciii., 483.

of persons injured by accidents, and to report as to what improvements or developments are desirable, and what steps are expedient to give effect thereto, regard being had to the recommendations made in the report issued by the British Medical Association in February, 1935, on "Fractures."

The appointment of this committee—which was secured largely by the efforts of Mr. Geoffrey Peto, M.P., chairman of the executive committee of the Central Council for the Care of Cripples—marks an important step forward towards the provision of adequate treatment of industrial and other accident cases. It is particularly satisfactory to note the emphasis laid in the terms of reference on the "restoration of the working capacity" of such persons. This at once suggests the kind of work which is carried out by the Rehabilitation Commissions in New Jersey and elsewhere, under which schemes injured persons are not merely paid sums of money as compensation, but are taken seriously in hand by organisations, financed by the State, which ensure that as far as possible no physical handicap shall be allowed to develop or to persist longer than can be avoided, but that skilled treatment and training in industry shall be made available for all those who are so unfortunate as to be injured by accident. The experience of these commissions, as well as that of Prof. Lorenz Böhler's clinic in Vienna, has amply demonstrated that such a scheme very soon pays for itself by saving costs of compensation and maintenance of the patients; while the saving in suffering, both physical and mental, is immense. No one grudges the payment of charitable contributions to meet the needs of cripples, but it is scandalous that large numbers of persons should be allowed to drift into a condition of prolonged or permanent physical incapacity through lack of efficient and properly coördinated arrangements for treatment. Many of our own surgeons are alive to this; see, for instance, the Liverpool discussion (p. 1119). The new committee will pay great attention to suggestions put forward by those with experience of the care of the crippled and disabled.

THE HODGKIN GIANT CELL

"HODGKIN'S DISEASE" must be one of the most firmly established of eponyms and surely one of the most justifiable. In his paper entitled "On some morbid appearances of the absorbent glands and spleen"[1] Thomas Hodgkin gave the first clearly defined account of this condition, and in the main his description of the morbid anatomy of the disease which now bears his name stands good to-day. The exact histology was worked out at a later date, and here the apportionment of credit becomes more difficult. In descriptions of the well-known giant cells of the Hodgkin lesion, one of the most characteristic features of the microscopic picture, two names are often encountered: in European literature that of Carl Sternberg, who has just died in Vienna at the age of sixty-three; in America that of Dorothy Reed. Both these authors made substantial contributions to the histology of Hodgkin's disease, and accurately described the giant cells in question.[2] Although it would be wrong to suppose that these descriptions were novel at the time of their publication, yet they were much more accurate and detailed than any which had been given up to that time In this country we like to give credit to W. S. Greenfield (1846–1919) for one of the earliest correct descriptions of the histology, including the giant cells. Here are his own words.[3]

"*Lymphatic glands.*—In all five cases the change in the glands was the same in kind, though it differed in degree, in different cases and in the various glands from the same case. It consisted essentially in a sort of chronic inflammation involving especially the fibrous stroma of the gland, which became thickened and gradually obliterated entirely the interstices, so that the gland became a mass of dense, tough, fibrous tissue, with little or no trace of adenoid structure. In the early stages . . . there was some general enlargement of the glands, the fibrous stroma appeared coarser, and there were a large number of multinucleated cells adherent to the trabeculæ, well seen on washing away the lymph cells. These multinucleated cells, containing from four to eight or twelve nuclei, were often collected in clusters in the parts of the gland especially where the fibrous change was progressing. . . ."

Greenfield was appointed professor of pathology in Edinburgh in 1881, and according to Boyd continued to teach there the true histology of the disease to successive generations of students. Yet even before Greenfield's description the Hodgkin giant cell was not unknown. There is a reference to it in the second edition of Wilks and Moxon's "Lectures on Pathological Anatomy" (1875)—"The very soft forms too" of Hodgkin's disease "have often large polynucleated cells, while the meshwork is delicate, so that they become very like soft carcinomas, only that the cells are not epithelioid but lymphoid." In the first edition (1859) of these lectures (by Wilks alone) Hodgkin's disease is not mentioned. Wilks "took credit to himself for having unearthed" Hodgkin's original paper,[4] and he was mainly responsible for the introduction of the eponym. This is not in any way to belittle the importance of Sternberg's contribution to the pathology of Hodgkin's disease. Admittedly he propounded the view that it was a special type of reaction to tuberculous infection—a hypothesis not now accepted—but his description of the morbid anatomy and histology of the disease was precise and accurate and a big advance in our knowledge of an obscure subject.

[1] Med.-Chir. Trans., 1832, xvii., 68.
[2] Sternberg, C.: Zeits. f. Heilk., 1898, xix., 21; Reed, D.: Rep. Johns Hopkins Hosp., 1902, x., 133.
[3] Trans. Path. Soc., 1878, xxix., 272.
[4] Trans. Path. Soc., 1878, xxix., 269; Guy's Hosp. Reps., 1865, xxvi., 56.

Dr. J. A. RYLE will deliver his inaugural address as professor of physic in the University of Cambridge on Tuesday, Nov. 26th, at 5 P.M. He will speak on the aims and methods of medical science.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Afternoon courses will be held in venereal diseases at the London Lock Hospital (Nov. 18th to Dec. 14th); in infants' diseases at the Infants Hospital (Nov. 25th to Dec. 7th); in dermatology at the Hospital for Diseases of the Skin, Blackfriars (Nov. 25th to Dec. 7th). An all-day course in proctology will be given from Nov. 25th to 30th at St. Mark's Hospital. A course will be given at the Brompton Hospital on Nov. 30th and Dec. 1st, and a special all-day course in thoracic surgery will also be given there from Dec. 2nd to 6th. For M.R.C.P. candidates there will be an evening clinical and pathological course at the National Temperance Hospital, on Tuesdays and Thursdays at 8 P.M., from Nov. 26th to Dec. 12th, and from Dec. 9th to Jan. 10th (excluding Christmas week) courses in chest diseases will be held at the Brompton Hospital and at the Victoria Park Hospital. Full information may be had from the secretary of the Fellowship, 1, Wimpole-street, London, W.1.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXVII.—PROGNOSIS OF CÆSAREAN SECTION

CÆSAREAN section, as a major surgical operation, is relatively safe; as a method of effecting childbirth, it is relatively dangerous. It is well to emphasise this; for although Cæsarean section is not, let us hope, used as an alternative method of delivery in normal cases, the indications for which it is nowadays sometimes performed appear to be extremely flimsy. The remarkable increase in the number of Cæsarean sections during the last twenty years has been due to a gradual relaxation of the indications for the operation. Formerly, contracted pelvis and obstructed labour were its only indications, but now it is done for almost every imaginable complication of pregnancy and labour. Most of the newer indications can be classed as "fœtal"; and there can be no doubt that an exaggerated idea of the value of the infant's life as compared with the life and health of the mother (due to the fact that nowadays pregnancies are spaced, regulated, and relatively rare) is having a subtle influence on modern obstetrical procedure. Cæsarean section performed for pelvic contraction in otherwise healthy young women without complications and not in labour shows a mortality of from 1 to 2 per cent.; whereas natural delivery in young women, comparable in all respects except absence of pelvic contraction, shows a mortality of from 1 to 2 per 1000. This seems to be a fair comparison and shows that Cæsarean section as a method of childbirth is only one-tenth as safe as normal labour.

It is convenient to consider the prognosis from two points of view: (1) the *immediate* prognosis: what is likely to be the mortality of the operation in the various conditions in which it is performed; (2) the *remote* prognosis: what is the risk of rupture of the scar in subsequent pregnancies and labours. Moreover, the prognosis must also be considered in relation to the type of operation performed. The *classical* operation, being easy and quick, is still being done much oftener than the *lower segment* operation which, although requiring more surgical skill and usually taking longer, is in most cases safer.

Classical Cæsarean Section

Munro Kerr and Eardley Holland in 1921 undertook an investigation into the results of classical Cæsarean sections performed in hospitals in Great Britain and Ireland during the years 1911–20 inclusive, and published the full analysis of 4197 operations.

THE MORTALITY

First and foremost must be made the essential distinction between the mortality of the operation as performed on healthy women before the onset of labour, and the mortality of the operation when performed in the presence of possible intrapartum sepsis or for complications such as eclampsia, antepartum hæmorrhage, and so on. The true mortality of the operation per se is obtained by taking cases in which it was performed for contracted pelvis in healthy patients who were not in labour—where, therefore, there was no risk of intrapartum sepsis due to vaginal examinations, rupture of the membranes, or prolonged labour. In such favourable circumstances the operation is a particularly safe one in the hands of a skilful operator and in suitable surgical surroundings. But very remarkable is the progressive rise in mortality as the risk of intrapartum sepsis, or the unfavourable state of the patient, increases. In Kerr and Holland's analysis it was shown that the *maternal mortality* for cases not in labour or very early in labour was 1·6 per cent.; for cases after attempted surgical induction of labour, 14 per cent.; and after "failed forceps" the mortality reached the high figure of 26 per cent. The high mortality after cases long in labour, and especially after attempts at delivery, is an indication of the risks likely to be incurred when the operation is performed under such circumstances; but an immense factor for good or evil is, of course, the way the patient has been handled before the operation, and whether examinations and manipulations have been made with strict aseptic precautions or otherwise. The maternal mortality of Cæsarean section is almost entirely due to septic infection, leading as a rule to general peritonitis; pneumonia (probably of septic origin), pulmonary embolism, postpartum hæmorrhage, and postoperative intestinal obstruction account for a few deaths.

The *fœtal mortality* in cases in which forceps had been tried and failed amounted to 27 per cent. in the above series, and the early mortality of the infants who survived delivery was 11 per cent. The fœtal or infant mortality in such cases is from subdural cerebral hæmorrhage due to forceps-pressure. It is important to bear in mind that cerebral hæmorrhage does not affect the action of the fœtal heart, but paralyses respiration; so that although intrauterine existence is not interfered with (the fœtal heart will therefore be heard before delivery) the fœtus cannot breathe after birth.

PLACENTA PRÆVIA

In the treatment of placenta prævia Cæsarean section is becoming increasingly prominent. In the past it has been confined to cases of the "complete" variety, in which the bleeding is considerable and it is seldom possible to effect delivery by the natural passages, without further severe loss of blood. The operation is especially indicated in cases of complete placenta prævia in which labour has not begun and the cervix is closed and resistant. In such cases Cæsarean section performed after the first attack of bleeding is certainly less dangerous than delivery by the natural passages—besides offering almost the only chance of survival for the fœtus. But given skilled operating and the proper environment Cæsarean section need not be limited to this class of case. Provided the patient is in good condition, the mortality of Cæsarean section for placenta prævia should be no higher than for contracted pelvis—viz., 1 or 2 per cent.; the mortality of placenta prævia treated conservatively, even in skilled hands, is certainly higher than this. The tendency of modern practice is, quite rightly in my view, towards the increased employment of Cæsarean section in the treatment of placenta prævia. The position is well stated by A. H. Bill, who has recently published a series of 104 cases, 80 per cent. of which were treated by Cæsarean section, with a maternal mortality of rather less than 2 per cent. Cæsarean section is not contra-indicated by the death of the fœtus, for the operation is mainly undertaken

in the maternal interest. In order to reduce operative shock the operation should be performed under spinal or gas-and-oxygen anæsthesia, and intravenous saline or blood transfusion may be indicated during the operation.

ECLAMPSIA

When Cæsarean section is performed for other than local complications (such as pelvic contraction and other causes of obstruction, and placenta prævia) the issue becomes confused; for the prognosis of the complication when treated by Cæsarean section, rather than the prognosis of the operation itself, becomes dominant. An outstanding example is eclampsia. The recent collective investigation of eclampsia in Great Britain demonstrated, according to the analysis made by T. Watts Eden, that patients with eclampsia delivered by Cæsarean section had a mortality much greater than the average for the disease, *both in mild and in severe cases;* and it is now generally held that Cæsarean section diminishes the chances of recovery instead of increasing them.

THE RISK OF SUBSEQUENT RUPTURE OF THE SCAR

A collective follow-up investigation undertaken a few years ago into over 1000 cases of Cæsarean section performed by British obstetric surgeons between the years 1911 and 1918 inclusive has made us aware that the risk of rupture of the uterine scar is a more serious menace than was once believed. It is now known that rupture of the scar is liable to occur in about 4 per cent. of patients who become pregnant subsequently and proceed to term or near it. In the recorded cases rupture has occurred almost as often during pregnancy as during labour, and occasionally as early as the seventh month. The prime cause of rupture is imperfect healing of the uterine incision resulting in a thin scar in which muscle union has failed. Imperfect healing is due either to infection or to hurried and inefficient suturing of the uterine incision. An important point to consider in prognosis is whether a given patient may be peculiarly liable to this accident. This cannot be prophesied with certainty, and all we can say is that if there was a smooth and afebrile convalescence from an operation performed by an expert, the scar is not likely to be thin; but if the convalescence was pyrexial with signs of uterine or abdominal infection, and if the operation was performed hurriedly (and the high proportion of ruptured scars which have followed operations done hurriedly in women desperately ill from eclampsia or antepartum hæmorrhage, for example, is remarkable) the chances of rupture are higher.

When therefore the problem of how to manage a future pregnancy has to be faced, these points are to be considered. Is the saying "Once a Cæsarean always a Cæsarean" always true? By no means. If the circumstances of the last operation point to the probability of a weak scar, the patient should be advised to have another; but if the circumstances were favourable, and there is no reason to anticipate any difficulty in labour, she may be allowed to deliver herself naturally, but should be able to get prompt surgical assistance should the necessity arise.

FUTURE REPRODUCTIVE FUNCTION

A subsidiary point which emerged from the aforesaid inquiry was the high percentage of infertility which followed the operation. Less than half the patients became pregnant again. This, of course, only confirmed common experience; the infertility is chiefly voluntary, because many women dread or dislike the idea of a repeated operation. The point is an important one and deserves consideration before Cæsarean section is undertaken for a fœtal indication (e.g., fœtal distress, faulty presentation). If the long view is taken, the life of a single child is of small value compared with preserving the fertility of a young mother and her ability to bear children in a natural way (and as many as she wants).

Lower Segment Cæsarean Section

In this operation the uterine incision, vertical or transversely curved, is made in the lower segment after incising the uterovesical fold of peritoneum and pushing down the bladder. The operation is safer than the classical operation; for the immediate mortality is lower, and the risk of rupture of the uterine incision in subsequent pregnancy and labour and of postoperative intestinal obstruction is less. These advantages ensue because (1) the uterine wound is covered in by a thick layer of uterovesical fascia and by the bladder, and a perfect closure of the uterovesical peritoneum can be made, thus lessening in infected cases the likelihood of spread of infection from the uterus to the peritoneal cavity; (2) the wound lies in an inactive part of the uterus, and is at rest during the process of healing, giving a better chance of a strong and perfect scar; (3) the position of the wound is such that adhesions to intestine cannot easily occur.

The lower segment operation is therefore specially suitable for use in infected or potentially infected cases, and has greatly improved the prognosis in this class of case. The operation has gained favour very slowly in this country, and no large body of statistics yet exists. An analysis of 874 operations performed at the Chicago Lying-in-Hospital has been published by J. P. Greenhill, with a mortality of only 1·26 per cent.; in 50 per cent. of the cases the patients were in labour at the time of the operation, and in 20 per cent. the membranes had been ruptured for some hours. In the operations in which the indication was cephalo-pelvic disproportion (almost one-half the total) the mortality stood at the low figure of 0·8 per cent. A comparison of these figures (which are fully confirmed by other operators) with the figures already given for the classical operation leaves little doubt which is the better operation. Moreover, the lower segment operation carries a much greater protection against rupture of the scar, not more than 25 cases of rupture having been so far reported in the entire world-literature.

EARDLEY HOLLAND, M.D., F.R.C.S.,
Obstetrical and Gynæcological Surgeon,
London Hospital.

LONDON HOSPITAL.—Sir William Goschen is appealing for £80,000 for the London Hospital. New wards are required for ear, nose, and throat cases, improvements and extensions are necessary to the clinical laboratories, and the X ray department needs new equipment. The nurses' home is inadequate and must be extended, and the domestic staff require a hostel. The money is asked for immediately so that the considered plans may be put into execution.

NORTHERN WOMEN'S HOSPITAL, NEWCASTLE-UPON-TYNE.—The Duchess of Northumberland recently officially opened the new premises of this hospital in Osborne-avenue. The hospital, which has been in existence for 18 years, provides accommodation for women of small means who wish to contribute towards the cost of treatment but cannot afford the more expensive nursing-homes. During the past three years 90 per cent. of all the expenses have been covered by the patients' fees.

SPECIAL ARTICLES

BRITISH MEDICAL ASSOCIATION

MEETING IN MELBOURNE

SECTION OF OBSTETRICS AND GYNÆCOLOGY

Dr. J. S. FAIRBAIRN (London), the president, opening a discussion at this section on the Prevention and Prognosis of the

Late Toxæmias of Pregnancy

defined the condition as a clinical syndrome of which raised blood pressure and albuminuria are the most prominent and constant signs, although other manifestations such as headache, vomiting, œdema, jaundice, and antepartum hæmorrhage are frequently associated. Careful clinical observation was essential before arriving at the diagnosis of toxæmia. Albuminuria, for instance, even of proved renal origin, might mean much or little. By excluding those cases whose toxic manifestations appeared before the twenty-eighth week of pregnancy, the difficulty of differentiating them from cases of chronic nephritis complicating pregnancy was to a large degree overcome. Because of our ignorance of the exciting cause, the physiological control of the condition must be empirical. Dr. Fairbairn enumerated various systems designed to prevent the condition; he himself favoured a diet rich in calcium and vitamins A and D, with additional carbohydrate in the last few weeks of pregnancy. Notwithstanding all care, however, toxæmic states would still occur; but by means of careful antenatal observation and prompt treatment many cases could be controlled in the earlier stages. The cardinal points of treatment were elimination, dietary control, and prevention of acidosis. Should the toxæmia not yield to these measures, or become intensified, the termination of pregnancy must be seriously considered.

There had been no definite fall in the maternal death-rate from eclampsia in recent years in spite of energetic treatment of patients in the "pre-eclamptic" state; eclampsia would not be entirely prevented until some means of preventing toxæmic states was available. Impending convulsions might be anticipated in cases showing a steady rise in the blood pressure, lessened secretion of urine, and severe headache, visual disturbance, or epigastric pain. Eclampsia was an acute condition of sudden onset; cases of gradual onset exhibited symptoms predominantly renal and rarely convulsions. In developed eclampsia, the prognosis depended upon the number of fits and their sequelæ. Jaundice was an unfavourable symptom. Early return of consciousness after the cessation of the fits, fall in pulse-rate, and increased secretion of urine were favourable omens. The prognosis for cases of toxic albuminuria under treatment was determined more by the daily amount of urine passed than by the actual amount of protein in the urine. Pregnancy might be allowed to continue whilst improvement was maintained. The remote prognosis for toxæmic cases depended upon the completeness of recovery. As the severity of the attack was of little moment compared with its duration, the importance of terminating the pregnancy before permanent damage resulted was apparent. The greatest care must be exercised during subsequent pregnancies, and failure of a second trial of pregnancy prohibited any further risk. Persistent high blood pressure was an unfavourable sign. A considerable fœtal mortality attended all toxæmic states, being more marked in the convulsive cases than in the non-convulsive.

Dr. JOHN S. GREEN (Melbourne) agreed that rest, elimination, and dental attention with dietary restrictions might lessen the incidence of toxæmia. In spite of all preventive treatment serious complications might ensue. The medical disability of such cases as temporarily recovered from their toxæmia was difficult to assess. There was always a tendency to improvement as time went on. The persistence of a high blood pressure and unsatisfactory urea-concentration tests suggested a latent phase which might relapse in subsequent pregnancies. In the immediate pregnancy the vast majority of cases responded promptly to treatment, but there was always a residue demanding serious consideration and often requiring interference with the course of pregnancy. Subsequent recurrence was to be expected in about one-third of all cases. The response to treatment was often at variance with the acuteness and severity of the toxæmia. Dr. Green mentioned various associated factors which might be used as a basis for the management of these toxic cases—i.e., early onset (before 35 weeks); significant past history; age and parity; bad renal function tests. If albumin persisted for longer than five days the presence of two of these factors suggested an unfavourable outcome and the presence of a third and certainly of a fourth justified immediate interference. The persistence of albuminuria with an associated high blood pressure had been suggested as a fifth factor. Consideration of these factors would be found valuable in attempts at individual prognosis regarding future pregnancy and health.

Dr. F. BROWN CRAIG (Sydney) believed that the ultimate toxic cause of the toxæmias was one elaborated in the mother's intestine—perhaps *B. coli*. Satisfactory elimination was undoubtedly a great preventive measure. Albuminuria diminished when constipation was overcome, and a well-balanced diet was always valuable. If elimination and dieting did not control albuminuria, timely induction of labour was indicated. In the primipara care and diet is more important than in the subsequent pregnancies; increased quantity of food in terms of calories was not required. With regard to maternal prognosis the death-rate of eclampsia in the Royal Hospital for Women, Sydney, was 6·9 per cent. In cases of toxic albuminuria treated by termination of pregnancy the group mortality was 15·7 per cent., which was much greater than the average. Considerably more of these cases were admitted in the winter months. Toxic albuminuria should be treated in hospital and pregnancy terminated if albuminuria did not clear up in two or three weeks. Toxæmia recurring in later pregnancies should be treated by termination and subsequent sterilisation. The main cause of death in the children of albuminuric patients was prematurity, whilst the children of eclamptic mothers were always bad risks.

Dr. KENNETH WILSON (Brisbane) held that many dietary claims had not justified themselves. Adequate antenatal supervision would largely eliminate eclampsia. He advised the early exhibition of assimilable calcium and alkalis, though admittedly some patients became toxæmic whilst taking calcium. No pregnancy should occur for at least 12 months after the disappearance of the albumin and the return of the blood pressure to normal.

Dr. MARY DEGARIS (Geelong, Vict.) said that early iliac pain was apt to pass on to pyelitic conditions,

and in some cases to albuminuria. In her view it was a mistake to starve patients suffering from toxæmia.

Prof. J. B. DAWSON (Dunedin, N.Z.) pointed out the difficulty of distinguishing the primary toxin which initiated the condition from the secondary ones which affected the parenchyma. In many pregnancies there was a very definite metabolic upset. Toxæmias occurred at the times of chorionic activity or degeneration, and he believed the chorionic elements to be the originating cause. It was quite likely that an endocrine convulsion was the starting point of these toxæmias. Some of the gravest toxæmias were associated with the development of a hydatidiform mole and it was thus possible that the anterior lobe of the pituitary gland might have a preponderating action in the development of a late toxæmia of pregnancy.

Dr. HUBERT JACOBS (Melbourne) believed that an undue increase in weight had some significance as a premonitory toxæmic manifestation.

Dr. H. A. RIDLER (Sydney) said that prognosis in these cases depended largely on good nursing.

Dr. REX MATTERS (Adelaide) urged the need of further investigation of the possible endocrine factors underlying these cases. The water metabolism factor of the posterior pituitary lobe might be very active in the toxæmias and it was this which might be decreased by the morphine therapy elaborated by Stroganoff.

The PRESIDENT spoke of the need for the establishment of a clinical research school to devise constructive methods of prevention. A consideration of the effects of treatment on already developed cases must be a very valuable guide.

Sir EWEN MACLEAN (Cardiff) opened a discussion on the Remote Results of

Puerperal Sepsis

He spoke of the difficulty of procuring accurate information on the prevalence of maternal morbidity. Little coöperative investigation was being conducted in this field. Much could be done by enlisting the good offices of the Health Organisation of the League of Nations and the larger approved insurance societies. "Remote" results of puerperal sepsis were those discovered some time after the puerperium. It would be agreed that all infected cases were associated with some degree of trauma, which served as the gateway for unresisted infection. The morbidity arising from sepsis at the time of confinement was extremely difficult to assess in actual figures because of the scantiness of the records, but had been conservatively estimated at 40,000 per annum in the British Isles. Sir Ewen referred to a table drawn up by Dr. Donald McIntyre which showed the importance of infective lesions resulting from childbearing on the reproductive tract. The conditions considered included chronic cervicitis, chronic endometritis and subinvolution, chronic salpingo-oöphoritis and pelvic cellulitis.

Chronic endocervicitis was essentially associated with traumatic lesions, great or small. Persistent infective cervical lesions led to disorder and degeneration of tissue, predisposing to malignant changes at a later date. Subinvolution was a manifestation of a very mild degree of infection, possibly unnoticed during the puerperium, which definitely lowered the fertility-rate. Sir Ewen emphasised the tendency for tubo-ovarian disease to subside and commended the general tendency of the profession to adopt conservative treatment. Chronic urinary infection was a puerperal sequela not generally afforded its true importance because of the difficulty in tracing the infective process from "history" alone. Thrombophlebitis following puerperal infection and phlegmasia might result in very prolonged disablement and call for careful physiotherapeutic measures to ensure their complete cure.

Dr. RUPERT FURBER (Sydney) said that there was no real proof of any association between fibrosis uteri and puerperal sepsis. No microscopic inflammatory changes in the myometrium could be demonstrated even in advanced cases. Fibrosis uteri was a clinical entity associated with a halting in the process of involution. Various disturbances in lactation might be associated with its development.

Dr. ARTHUR SHERWIN (Melbourne) discussed the late results of puerperal sepsis affecting the structures adjacent to the uterus. The anatomical pathway of the spread of infection was considered—tubal involvement being by direct spread whilst broad ligament infection occurred via lymphatics and occasional thrombo-phlebitides. Many cases of salpingo-oöphoritis would resolve in time. He could not agree that gonorrhœal infection was uncommon in the upper genital tract. In his opinion the tubes were not usually involved primarily in puerperal sepsis, but were commonly involved in gonococcal conditions; the gonococcus soon died out but its effects were carried on by the secondary invaders.

Dr. N. MCI. FALKINER (Dublin) spoke of a case of mild sepsis following Cæsarean section. Hysterectomy was performed 18 months later for profuse menorrhagia which revealed a small abscess in the uterine wall around a residual silk suture. Patients with sepsis following full-term confinement often recovered completely, whilst those infected during miscarriage might show late sequelæ.

Dr. EDWARD WHITE (Melbourne) said that complete resolution of puerperal sepsis might be expected as a rule. Active treatment should be limited to medical measures, particularly medical diathermy, which was extremely useful in pelvic cellulitis. He had found vaccine therapy valuable in early chronic cases. He agreed that fibrosis uteri was a condition quite apart from puerperal sepsis; no microscopic evidence of inflammation could be adduced.

Dr. B. MILNE SUTHERLAND (Melbourne) believed that late puerperal sepsis led to much chronic ill-health and invalidism. Puerperal sepsis at full time did not as a rule lead to sterility. Mild irritation of the bladder associated with chronic puerperal cervicitis was a definite lesion calling for careful treatment. A late pelvic cellulitis might scar the parametric tissues as it resolved, constricting the ureter and leading to attacks of pyelitis. Severe congestive menorrhagia might eventually follow phlegmasia alba dolens.

The PRESIDENT said that chronic ill-health led to neurasthenia even after very minor infection, and pleaded for the consideration of the human element as apart from the pathological manifestation. The discharge of chronic cervicitis was a constant worry, whilst recurrent attacks of salpingo-oöphoritis might make a chronic invalid. Abortions were more often the cause of chronic tubal disease than were full-time pregnancies. The infecting agent in septic puerperal peritonitis undoubtedly spread by anatomical routes. Radium was the method of choice in the treatment of uncomplicated fibrosis uteri to the exclusion of hysterectomy.

Sir EWEN MACLEAN, in reply, once more emphasised the necessity for prolonged conservative treatment in these cases.

SECTION OF OPHTHALMOLOGY

Mr. A. J. BALLANTYNE (Glasgow) presided over this section when a discussion on

Glaucoma

with special reference to medical aspects and early diagnosis, was opened by Mr. H. M. TRAQUAIR (Edinburgh). He said that he would deal only with clinical experience in that form of primary glaucoma known as chronic or simple glaucoma. In his view acute and subacute glaucoma differed from chronic glaucoma in violence only, not in essential nature. The cause of glaucoma was still unknown; such conditions as hypermetropia, small cornea, and shallow anterior chamber were predisposing causes only. The chief feature of the disease was that the patients were (1) elderly, and (2) of an anxious, nervous temperament. When glaucoma occurred in the young the family history usually indicated the predominance of hereditary factors. As the disease was common in all classes of society it did not seem probable that nutritive or hygienic conditions affected it. Since both eyes were invariably affected, glaucoma should be considered as a disease of the patient—not merely one of the eye. The most usual symptom complained of was recurrent dimness of vision in one eye, and though this symptom was usually described as one of the "prodromata" of glaucoma, it was clearly a sign of the established disease. Glaucoma commenced without symptoms, and its early diagnosis depended upon the correct interpretation of the patient's early symptoms. The most difficult cases to diagnose were those that commenced insidiously; such cases were often first detected during the routine examination for glasses. Where there was any doubt, the tonometer should be used. Mr. Traquair thought that the so-called "normal" tension of 20 mm. was rather high, and he was always suspicious of eyes with a tension of over 22 mm. If a significant drop in the tension occurred after the instillation of eserine a diagnosis of glaucoma was strongly supported. In a normal eye, only a very slight fall in tension occurred. The field changes in glaucoma were sometimes of value in diagnosis—though more frequently in prognosis. Field changes were the result of the glaucomatous process, and thus could not be present until a relatively late stage of the disease. The stage before they occurred Mr. Traquair designated the "pre-perimetric stage," and he pointed out that the more expert one became in detecting field changes the shorter would be this stage.

Cases of possible or suspected glaucoma could be classified in two main groups—according to whether field changes were present or not.

GROUP 1. *No obvious or gross field changes present.*—(*a*) Neither symptoms nor signs present: The suspected eye appeared normal in every way, but was suspected because of definite glaucoma in the other eye. (*b*) Symptoms alone present: A history of haloes, periods of ocular discomfort, or other suggestive symptoms were given, but the optic disc and tension appeared normal. (*c*) Ophthalmoscopic signs alone present: Cupping or pallor of the optic disc, alone or together, was found in routine ophthalmoscopic examination. (*d*) Increased intra-ocular tension: During routine examination the tension might be found to be raised. (*e*) Various combinations of those features mentioned under (*b*), (*c*), and (*d*) might be found.

GROUP 2. *Gross and easily detected field changes present.*—Here the problem was not so much the detection of early changes but the proper interpretation of the changes. The main point in investigation was to detect the earliest possible field change. This was done by using the weakest possible stimulus. A 1 mm. white object used at 2 metres on a Bjerrum screen was, generally speaking, the smallest reliable stimulus. The isopter for 1/2000 which normally extended for about 26° all round and included the blind spot might be contracted in early glaucoma, and if contracted to within the 12° circle, the blind spot would be left entirely outside it. Another typical change was a contraction of such degree that the field skirted around the inner side of the blind spot, leaving the upper and outer parts exposed. This was described as "baring of the blind spot," and was referred to by Sinclair as "Bjerrum's symptom." It was, in Mr. Traquair's experience, the earliest field change found in suspected glaucoma, and he had never found it apart from glaucoma, although, of course, it might possibly occur. This sign was the precursor of the typical arcuate scotoma seen in glaucoma, although the latter did not appear to grow out of the former, but appeared to arise independently on or about the 15° circle, a little distance from the blind spot. It was only in its later stages that the arcuate scotoma merged with the blind spot, and therefore it was in no way an "enlargement of the blind spot." When more fully developed, the arcuate scotoma crossed the vertical meridian and formed the "nasal step."

Mr. Traquair then briefly summarised his remarks, concluding that glaucoma should be diagnosed by the clinical picture as a whole, not by any one sign. The only pathognomonic sign was increased tension, and this was not always easily elicited.

Lieut.-Colonel R. E. WRIGHT (Madras) said that there were two main types of glaucoma, the determining factors being (1) in the anterior, and (2) in the posterior chamber. The factors that operated in the posterior chamber were (1) vitreous swelling, and (2) alterations in the vascular bed. The speaker's impression was that the former type (vitreous swelling) was more common in Indians, and the latter in Europeans, possibly owing to the vascular changes that occurred as the results of anxiety. He thought that insufficient attention had been paid to a disease, epidemic dropsy, of which glaucoma was an essential part. Research into this disease might throw light on the causes of glaucoma. Epidemic dropsy was generally considered to be a form of beri-beri, though it occurred in epidemics, and did not occur all over India, while beri-beri was endemic. Medical treatment of glaucoma was a failure, because the patients were seen too late. He knew of no medical treatment apart from massage and miotics. For the early diagnosis he thought that field changes were the most reliable sign, and to elicit these he used a Bjerrum screen, not a perimeter. In taking the tension it was very important to measure both eyes, and measurements were of no use unless bilateral. Depression of the light sense was also a valuable sign in early glaucoma if vitamin-A deficiency could be excluded.

Prof. W. A. OSBORNE (Melbourne) said that the theories of glaucoma were legion, beginning with the obstruction of the canal of Schlemm, and passing through the imbibition of gels with varying hydrogen-ion concentration to the vogues of histamine and vitamin deficiency. He had little doubt that new theories would soon be advanced, but in his opinion the first line of attack should be an investigation of the means by which the intra-ocular pressure was kept so remarkably constant. This constant pressure

must be maintained by an oscillatory type of equilibrium, and he thought that the regulation of the standard pressure of the eye was a fundamental problem in glaucoma.

Dr. LOCKHART GIBSON (Brisbane) suggested that glaucoma was often due to a mild subthyroidism, with a mild myxœdema of the eye. He always gave his patients thyroid extract, he thought with considerable improvement.

Dr. W. F. ORR (Melbourne) doubted if tension were so all-important. He thought that an eye could stand high intra-ocular pressures without serious damage. In his opinion the field was not materially reduced while the intra-ocular circulation could be kept going, and if the choroidal veins were functioning the vision would not be impaired.

Dr. E. L. GAULT (Melbourne) said that the cause of glaucoma was still in the realms of speculation. He did not usually see patients in the very early stages, and always advised operation.

Dr. W. M BOX (Melbourne) gave a description of Troncoso's gonioscope, an instrument for investigating the angle of the anterior chamber. He showed various drawings illustrating normal and abnormal angles, and said that in some cases of glaucoma, at least, there were no peripheral synechiæ. Blocking of the canal of Schlemm by the iris could thus have no part in the production of glaucoma in these patients.

Mr. BISHOP HARMAN (London) thought that glaucoma was essentially a disease of the eye, often due to a congenital defect. Diagnosis with the ophthalmoscope could often be better done if the illumination were reduced in intensity. He thought that the screen test was best for corroborative evidence, though it often exhausted the patient.

Mr. J. H. DOGGART (London) said he had found that pulsation of the retinal veins abolished by a miotic was a suggestive sign of early glaucoma.

Dr. E. RYAN (Melbourne) asked if anyone had any suggestion for the treatment of malignant glaucoma—those cases in which the tension remained high in spite of any interference.

Dr. RINGLAND ANDERSON (Melbourne) stressed the importance of reduced illumination in perimetry, and showed a diagram of a perimeter in which he was able to reduce the illumination at will.

The PRESIDENT did not think that all cases of glaucoma were cases of the same disease. He asked what were the signs by which the disease could be diagnosed in the preperimetric stage.

Mr. TRAQUAIR, in reply, said that he did not agree with Mr. Bishop Harman that glaucoma was primarily a disease of the eye, and he could hardly visualise a congenital defect that did not operate until the patient was middle-aged. The only sign in the preperimetric stage was increased tension.

POST-GRADUATE LECTURES

AMONG the addresses delivered at post-graduate courses in the autumn session at the London teaching schools was one by Mr. Julian Taylor of University College Hospital. It appears here in abridged form.

OBSTRUCTION IN THE COMMON BILE-DUCT

(MR. JULIAN TAYLOR)

OBSTRUCTIVE jaundice is a common symptom and a constant source of contact between surgeon and practitioner. From the patient's point of view its appearance is always a very serious event, often more serious than he suspects, as it necessarily carries with it the probability of a severe operation. From the surgeon's angle the jaundice may be on the one hand his introduction to a simple case of gall-stones with an easy, highly satisfactory, and just occasionally expensive operation, or on the other hand it may be the sign indicating the presence either of incurable disease or of formidable difficulty with uncomfortable danger. Nevertheless, in the presence of jaundice he must nearly always undertake the responsibility of performing some operation, even when confronted with whatever old or enfeebled subject, and however precarious the patient's condition it is rarely possible for him to turn tail in the exercise of his discretion.

I propose to deal with the subject of common bile-duct obstruction, starting from its cardinal symptom jaundice, and it is needless to say that its commonest cause is gall-stones. I do not presume to detail their symptomatology, which I doubt not many of you know better than I; but I would like to refer to the nature of the stones that cause it.

Stones causing jaundice are commonly primarily formed in the gall-bladder, passing thence to the bile-ducts where they may grow to large size and where their residence may result in the formation of more stones. The stones that leave the gall-bladder for the common duct are nearly always the multiple faceted ones, as for some reason that I do not understand—although I have an idea about it—the round so-called pure cholesterin stones, whether large or small, single or multiple, rarely enter the cystic duct but seem rather to stay in the gall-bladder, and there to produce their symptoms. A small faceted stone may produce the severest biliary colic, but provided that it passes to the intestine the jaundice resulting is mild and evanescent. If the stone stops in the duct the jaundice of the first attack of colic may again be evanescent but the stone grows and the further attacks of colic that it precipitates are associated with an ever-deepening jaundice of longer and longer duration, so that eventually the patient may never be completely free from yellow discoloration. Nevertheless it is possible for stones to exist for ten years or more in the common bile-duct and to produce little trouble; but we must remember that biliary obstruction results in ever-increasing distension of the passages in the liver, and in severe and long-standing cases in a fibrosis of its substance. In recurring biliary colic we thus have to envisage the possibility either of the repeated passage of stones to the intestine or of the prolonged residence of one or more in the bile-duct or ducts with the consequences to the liver arising from the prolonged halt and increasing size of the stone. In prognosis the first is hardly more serious than uncomplicated stones in the gall-bladder, while the latter, always surely indicated where the jaundice is more than evanescent, carries with it the dangers both of possible cholangitis and of depression of the liver function.

In saying that jaundice is the cardinal symptom of stones that leave the gall-bladder, may I remind you that it may also be the only one, and when jaundice without preliminary pain appears in one

past middle age it is perhaps as commonly due to gall-stones as to anything else. It is here that we may turn to cholecystography for help in the diagnosis, although we may fail to receive it. For theoretically if, in the current fashionable slang, there is pathology of the gall-bladder, the shadow of organ should not be seen in the radiogram, and most frequently it is not, as the gall-bladder is usually seriously diseased when containing multiple faceted stones. But the usefulness of cholecystography is nevertheless now firmly established largely by its caprices, and we may see a gall-bladder as an opacity surrounding stones showing themselves as translucent areas or ring-like shadows, or occasionally as an opacity not fading for 24 hours or more and thus indicating defective emptying of the organ by reason of obstruction; and very rarely we may see a common bile-duct itself depicted as an opacity linear or segmented by stones.

HEPATIC INSUFFICIENCY IN RELATION TO GALL-STONES AND THEIR TREATMENT

When Gwynne Williams in 1932 collated the figures of a collective inquiry instituted by the Association of Surgeons, he found that the mortality of operations for stone in the common bile-duct all over the kingdom was 14·65 per cent. The figure was roundly condemned as deplorable by Lord Moynihan, but the fact remains that nearly 15 per cent. died, and I feel sure that in searching for the cause we must turn to the state of the liver. Depressed function was given as the cause in no more than 16 of 91 deaths, but I believe that it was an important accessory in determining a large number of the fatalities assigned to other causes.

When after apparently successful operations for stone in the common bile-duct patients fail to make rapid recovery, in the absence of chest complications or catastrophes like peritonitis one of two things is usually happening.

First of all, where a tube is draining the common bile-duct, large quantities of fluid may escape in the form of bile. This may rapidly and completely exhaust the patient so that in 48 hours he is visibly wasted and clearly failing. We often treat the loss successfully by collecting the bile and returning it to the patient either by œsophageal or rectal tube, the latter method having surprisingly enough no enema-like action. It is likely however that the essential part of the loss that is affecting the patient is that of chlorides rather than of the special bile contents, and intravenous or rectal saline injections during the first day or so will usually suffice to prevent this occurrence or to restore condition, until mouth feeding is firmly established. That the patient is suffering from the effects of loss of chlorides may be disproved or suggested by noting their presence or absence in the urine.

The second and far more serious event is the lapse of the liver into inefficiency. When this happens the cause may not at once be recognised unless we have learned the clinical appearances of hepatic failure. The patient may make a good recovery from the operation but after a day becomes apathetic and sleeps continually, the drowsiness deepening with remissions and finally passing into a coma from which he cannot be roused. Whether previously jaundiced or not his colour soon changes to a dirty greenish-yellow tinged with an ugly cyanosis. From this condition patients may recover spontaneously but they may die rapidly or they may continue in the same state with remissions for many days. I have seen this only once in gall-stones where a hard-drinking patient with a large liver had a stone in the common bile-duct, and I mistook it at first for post-operative cerebral thrombosis. The giving of a relatively large dose of glucose intravenously, say 30 grammes in a 5 per cent. solution, brings these people back to consciousness in a most satisfactory way.

If we believe that the functional state of the liver is the determining factor in the majority of the serious cases, the question at once arises how may we estimate its state of efficiency. I believe that at the present time little can be learned from laboratory tests unless the glycogenic function is practically exhausted, when the lævulose-tolerance test gives a clear answer. If a person swallows a quantity of lævulose he should absorb it completely in his liver so that it never reaches the general circulation. When in carrying out this test lævulose is found in the peripheral blood, the deduction is that the liver is practically out of action. We have stressed the hepatic insufficiency resulting from obstruction of the common bile-duct, but just as in prostatic disease damaged kidneys may be adequate for the body's needs, but with the onset of infection may very rapidly become gravely insufficient, so with the damaged liver the onset of cholangitis may change a case of common bile-duct obstruction from a serious but easily curable state into a most desperate business.

The subject of hepatic insufficiency naturally brings us to the question how may we attempt to obviate its disasters, and how may we treat patients so threatened. Our main resources are the general preparation of the patients for operation and the administration of glucose. In the general preparation the most important thing appears to be that we must not be in a hurry to operate but rather prepare the patient with perhaps a week or more of rest in bed, and with suitable feeding, glucose being added to the items of diet wherever possible. We delay operation not because we are frightened of jaundice, an old bugbear on which we need not lay too much stress, but because we wish to fortify the liver and to restore the patient's sugar and other metabolism, and also not less to make use of the stimulus to recuperative power that rest in bed seems always to provide. When an operation has been performed and we fear hepatic failure, it is usually sufficient to give the patient rectal or intravenous glucose injections until normal feeding is re-established, but it is rarely necessary to administer the large quantities often given by continuous infusion over many days, a method at the present time very much overdone as is our way with medical fashions. It is easily possible by the excessive intravenous or even rectal administration of fluid to produce œdema of the extremities, and remembering how many of these folk are fat, lethargic, and bronchitic, the possibility of at the same time embarrassing the lungs with watery secretion must not be forgotten.

I fear that I have overstressed the dangers attending stones in the common bile-duct but the average case is of course very different from the picture of hepatic insufficiency which I have outlined. It is obvious that the road to success in the treatment of these cases lies in the study of the group in which there is real danger, and it is perhaps fortunate that owing partly to danger to life of continued gall-stone jaundice, and partly to the visible disfigurement of the principal symptom, the surgeon is forced in almost all cases to undertake operative treatment. He will thus achieve gratifying success in many patients precariously ill; but he should remember that a

courageous operator is a surgeon with the patient's courage in his trust, and that where life is in danger operative interference should be kept to the necessary minimum directed towards restoration of liver function. There are thus cases in which the sole immediate aim of the surgeon should be the temporary drainage of the liver passages. I propose to say nothing more regarding the actual operative treatment.

ACCIDENTAL LIGATION OF THE COMMON BILE-DUCT

This next cause of obstructive jaundice follows in logical sequence preceding references to the operative treatment of gall-stones, and though I have fortunately so far no experience of the immediate results of the catastrophe I have operated upon two patients who had suffered it. In the first the duct had been incompletely occluded, and during the succeeding year he had recurring attacks of jaundice with intense itching, his condition being otherwise good. Exploring his abdomen I found that the bile-duct appeared to end in a bulbous dilatation as big as the end of one's thumb, but that leading from the duct higher up there was a narrow track passing to the duodenum and compressed by the expanded stump of the duct. The bulbous portion was joined to the duodenum by anastomosis and he made a good recovery. The second patient was in a far more serious plight and in the event she died. Aged 29, she had undergone cholecystectomy a year before and had suffered from unrelieved jaundice with itching ever since. Frail with hardly any muscle left on her bones she had a greatly enlarged liver and an intense dirty greenish-brown jaundice; her hæmoglobin was reduced to 50 per cent.; there was perpetual nausea and frequent vomiting. In her skin were many deposits of cholesterin, one of which formed a large tumour in the buttock, and in her muscles were a number of firm tumours that were hæmatomas in various stages of organisation. Three weeks were spent in preparing her for operation by administration of glucose, calcium chloride, and three blood transfusions, but we were unable to produce a satisfactory improvement in her hæmoglobin percentage. At operation no trace of the common bile-duct could be found among a mass of adhesions, only the stump of the divided hepatic duct inside the liver substance that had swollen and nearly concealed it. After freeing a small area of the duct from the liver substance it was joined to the duodenum, but she died 36 hours later, and at the post-mortem a pint of blood was found in the operation area. This patient died of a combination of hepatic insufficiency and hæmorrhage and I believe she would have had a better chance if I had attempted only the temporary drainage of the hepatic duct to the exterior, postponing anastomosis.

THE RELATION OF HÆMORRHAGE TO JAUNDICE

It is well known that jaundice favours the occurrence of hæmorrhage and it is thought that this is due to the presence of bile salts in the blood stream. There is no deficiency of calcium salts and therefore the giving of calcium before operation to prevent hæmorrhage in the presence of jaundice is probably quite useless; indeed it was administered in the last case in order that no known precaution might be omitted in a desperate situation. The two measures that seem to be useful are the administration of glucose and blood transfusion. The last case is the only one where I have encountered difficulty over hæmorrhage in jaundice, and it is to be noted that in this extreme example all known precautions were taken, but they proved inadequate to prevent the recurrence of the oozing from the cut surface of the liver that had occurred in the operation but that had been seen to have ceased before closing the abdomen. Nevertheless, I believe that except in unusually severe cases such as this, we need not fear hæmorrhage if before the actual performance of our operations we spend a little time, say a week or so, in getting our patients into good condition by ordinary feeding, by giving glucose, and occasionally by blood transfusion.

DISEASES OF THE PANCREAS

On obstruction of the common bile-duct by disease of the head of the pancreas I do not intend to say much. The disease is commonly either chronic pancreatitis or carcinoma and in the latter case it is well known to produce obstructive jaundice with distended palpable gall-bladder, and later the evidences of pancreatic dysfunction. Yet there are cases in which the pancreatic insufficiency provides the first symptom and the biliary obstruction is late. Chronic pancreatitis on the other hand may easily be confused with gall-stones. One has seen these people with attacks of abdominal pain recurring over years and associated with jaundice. Cholecystography may show a normal or enlarged gall-bladder, and only at operation is it discovered that the pancreas is thickened either locally in the head or universally throughout the organ. It may be difficult to decide at the time of operation whether the pancreatic condition is inflammatory or carcinomatous, and on two occasions in the last year or so I have made a wrong diagnosis at operation. In one of these cases a man in his twenties had jaundice unaccompanied by other symptoms, and at laparotomy proved to have a firm enlargement of the whole pancreas thought to be inflammatory. Cholecyst-gastrostomy gave temporary relief but in a short time he died, the cause being carcinoma of the pancreas.

CYSTIC DILATATION OF THE COMMON BILE-DUCT

One other cause of obstructive jaundice may perhaps be mentioned despite its rarity. I refer to cystic dilatation of the common bile-duct, of which disease we have had in University College Hospital during the last ten years 4 cases. The condition is one in which the bile-duct is dilated either moderately to take the form of a bile-containing cyst about the size of a tangerine, or greatly to one containing gallons of bile. The reason that I wish to speak of it is that although it is only in comparatively recent times that the condition has been recognised, it often has a clear symptomatology and clinical picture.

The patients are usually women and the symptoms often begin either in childhood or adolescence. They consist of attacks of pain in the upper abdomen and back with vomiting and jaundice. Sometimes infection is superadded to the picture when there are fever and rigors; but curiously enough, although infection is common, gall-stones are rarely produced. The actual lesion present is dilatation of the common bile-duct which may be spherical or saccular, and the exact way in which the recurring attacks of biliary obstruction occur is unknown. It is thought that they may be associated with a disturbance of neuromuscular mechanism, in the walls of the biliary passages and in the sphincter at the duodenum, but it is certain that in some of the cases there are similar dilatations in the liver.

These patients respond extremely well to the making of a stoma between the cyst and the duodenum. The condition is of some importance clinically because

it is usually missed, and in two of my three cases operations had previously been done, the true nature of the cause of the jaundice not having been recognised even at operation. Recently, however, I operated upon a woman aged 38 in whom the clinical syndrome in question had been accurately reproduced in the form of pain, jaundice, and vomiting in monthly attacks since the age of 13. The cause was a congenital deformity of the gall-bladder that had resulted in external pressure on the hepatic duct.

EFFECT OF RELIEVING OBSTRUCTION

Lastly, may I say something about the disappearance of jaundice after correction or short-circuiting of obstruction in the common bile-duct. Visible jaundice sometimes takes a long time to disappear and three or four weeks after removal of a stone a tinge of jaundice may still be present. Such delay need occasion the surgeon no anxiety because it does not signify that there is still any remaining obstruction in the duct. The effect of successful operation is nevertheless immediately felt by the patient who always finds that 24 hours after the operation, sometimes even on waking from his anæsthetic, itching has disappeared. If after an operation itching were not to disappear the surgeon would therefore at once have cause for uneasiness as it would certainly mean that the common bile-duct was still obstructed. The explanation of these well-known clinical facts probably lies in the difficulty experienced by the body fluids in removing bile deposited in the tissues rather than any delay in its disappearance from the blood stream. If therefore jaundice is rather long lasting and the surgeon has any anxiety about it, he has but to examine the blood when if the obstruction has been successfully treated no bile is found in the serum and he can prophesy a successful issue.

PANEL AND CONTRACT PRACTICE

Consultation Hours

THE terms of service provide that a practitioner shall attend and treat at the places, on the days, and at the hours to be arranged to the satisfaction of the insurance committee, any patient who attends there for that purpose. When applying to have his name included in the medical list the practitioner is required to indicate the hours and the days and places at which he will be available for consultation by insured persons. It is no part of the committee's functions to say to a practitioner who applies for inclusion in their list, "the hours you propose will not do," particularly if the applicant is merely starting practice and not buying an established practice. So long as he has no patients on his list, half an hour a day might be regarded as more than sufficient for the surgery consultation period; even if he states that he has a surgery only on certain days of the week, it might well be argued that insured persons who apply for inclusion in his list are aware of that fact and can have no cause of complaint. But in the case of a practitioner who has a number of patients it causes embarrassment to an insurance committee to find, for instance, that the doctor has no consultation period between 8 P.M. on Friday and 6 P.M. on Monday, and it is even less satisfactory to receive an application for inclusion in the list from a doctor who proposes to give a surgery period of one hour on Monday evening and one hour on Thursday evening. It would, of course, be very difficult to find a standard which would apply equally to practices of units and of thousands, but it might not be regarded as unreasonable that insurance doctors should have a definite consultation period every day, except Sundays. So many insured persons seem to be under the mistaken impression that they may see their doctor only during his recognised consultation periods that it is surely in the doctor's own interests that he should provide adequate time for surgery attendances, rather than have to make unnecessary home visits.

Prescribing Costs

Staffordshire panel committee have been drawing the attention of insurance practitioners in their area to the increasing cost of providing medicines. The letter runs:

"Well over one million prescriptions were issued in the area during the year 1934. A serious feature is the increase in the number of prescriptions issued by insurance practitioners in this county. The figures have steadily risen from 3·67 prescriptions per insured person in 1931 to 4·07 in 1934, an increase which is not justified by comparison with the average increase in 16 other areas in the Midlands—3·72 to 3·88. For the first six months of 1935, the position is even worse. The Staffordshire increase of 0·4 per insured person represents an additional 100,000 prescriptions per annum. This addition is due not only to an increase in the number of forms issued by doctors, but also to a growing and questionable tendency to order two or more medicaments at one and the same time. Even though ordered on one form, each medicine or appliance carrying a separate dispensing fee counts as a separate prescription. This point should be borne in mind. Undue prescribing reacts unfairly on the chemists."

The reminder that when two or three medicaments are ordered on one form each medicine or appliance counts as a separate prescription and carries a separate dispensing fee is a timely one.

Spinal Jackets

Under the provisions of the Medical Benefit Amendment Regulations, 1934, an insurance practitioner may now prescribe (or supply and claim the cost of) spinal jackets when required for treatment of fractures, dislocations, or diseases of the spine. This appliance is, of course, rather expensive, and it is often much cheaper to repair a jacket than to supply a new one. Insurance committees have usually taken the view that the greater includes the less; ergo, it is proper to allow the cost of repairing a spinal jacket rather than to supply a new one, if the doctor is satisfied that the repair will make the appliance fully satisfactory. An enterprising pricing bureau has, however, drawn the attention of an insurance committee to an official letter of the Ministry dated October, 1929, in which it is stated that

"no provision is made under the medical benefit regulations for the payment of the cost of repairing a prescribed appliance. The amount in question could not, therefore, be properly charged to the practitioners' drugs account, except by special sanction given as a result of an application by the insurance committee concerned."

If the position is still as indicated it is time the regulations were amended. Evidently the pronouncement of the Ministry has either been regarded with a Nelsonian eye or the official letter was sent to only one committee and safely interred in its archives, for we learn that an insured person in another area has had four spinal jackets since 1925 and repairs to his various jackets have been paid for by the insurance committee on no fewer than ten occasions—at a total cost of £34 7*s*. 10*d*.

PUBLIC HEALTH

Ultra-violet Treatment Given by Laymen

LAST month the Huddersfield town council were told that the baths' superintendent had been authorised to purchase an ultra-violet ray lamp. On which Dr. J. W. Hirst, physician to the Huddersfield Infirmary, said he thought he would be failing in his duty if he did not protest against permission being given to unqualified, unskilled people to give ultra-violet treatment without medical supervision of apparatus and persons treated. He moved that the minute be not confirmed, and his amendment was carried.

The question of the competence of a baths' committee to install ultra-violet ray apparatus arose in 1928 in Manchester and drew a wise pronouncement from Dr. R. Veitch Clark, the medical officer of health, which was reported in our columns at the time (THE LANCET, 1928, i., 418). He held that there was only one way in which the use of ultra-violet rays should be regarded—namely, as means of medical treatment. Unless a scheme provided for adequate medical supervision, both of the clinic and of the people who received treatment, it could not properly be adopted by a public health authority; or, one might add, by any authority or medical body responsible for the safety of the patients. Dr. Veitch Clark went on to say—and here again experience has amply proved him right—that dosage must be carefully graduated and controlled to suit each individual, if the possibility of harm is to be avoided. This control could only be effected properly by medical supervision, and the Ministry of Health had refused their approval of installation except under these conditions. Later deputations from the Manchester baths' committee visited Leeds, Bradford, and Stockport, where ultra-violet ray apparatus was installed in the public baths, and were informed that the innovation had proved a great success. There was no medical supervision while the treatment was given. The permission of the Ministry of Health for the installation had not been asked, and the medical officers of health of the three towns had raised no objections. Nevertheless, Dr. Veitch Clark stood firm and said he saw no reason to alter the views he had expressed.

Dr. Hirst's stand for adequate medical supervision revives the controversy. His protest is countered in the newspapers by statements intended to show the success obtained in Leeds, where ultra-violet ray apparatus was installed in 1927 and 100,000 treatments have been given—evidence of local satisfaction with the service. The good results are attributed by the baths' directors to employment of "trained" men to give the treatment; but this is a point on which there can be more than one opinion. It is true that skilful administration of treatment and care of apparatus present few technical difficulties, but the selection of suitable cases and the dosage for persons who suffer from some definite deviation from the normal—not merely convalescents or slightly subnormal individuals—is by no means so easy. Such tasks should not be undertaken by those who have no medical training and some acquaintance with ultra-violet therapy. The success of the Leeds scheme must be put down to the policy of working in conjunction with the medical profession and therefore to their selection of cases. Treatment is refused to anyone under medical care except on the doctor's recommendations; cases of suspected illness are referred for medical opinion; and preliminary estimation of skin-reactions by erythema tests precede treatment. The Leeds experiment therefore closely resembles the procedure followed at many clinics, but it seems to differ nevertheless in certain important respects. In the first place the technical (non-medical) attendants are required to distinguish the normal (suitable) from the abnormal (not suitable) case. This leaves a definite possibility of serious error: for example, it is by no means easy even for the skilled medical examiner to detect the very early or the quiescent cases of pulmonary tuberculosis and to exclude them; the early case of diabetes might equally be missed; and patients with carcinoma, who sometimes show initial improvement in general health under ultra-violet treatment, might be regarded merely as persons in need of a tonic.

Stricter regulations seem to be enforced in Bradford, where it is reported that treatment is given only under a doctor's prescription. If this includes prescription of times of exposure and frequent periodic re-examination, the usual safeguards insisted upon in clinics have been adopted by this authority. Placing the apparatus in a room or building adjoining public baths presents no drawbacks, so long as its satisfactory insulation is achieved; indeed, the proximity of the baths becomes in these circumstances an advantage for the patients who will not require to undress more than once.

In arranging all the schemes, however, it seems to us essential that a medical authority should choose the apparatus and be responsible for the conditions of administration. A medical man or woman should select the patients, prescribe their irradiation, periodically inspect their treatment, and discharge them, and also take responsibility for the qualifications of the staff.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 2ND, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2975; diphtheria, 1271; scarlet fever, 30; acute pneumonia (primary or influenzal), 822; puerperal fever, 25; puerperal pyrexia, 118; cerebro-spinal fever, 11; acute poliomyelitis, 22; acute polio-encephalitis, 2; encephalitis lethargica, 5; continued fever, 1 (Paddington); dysentery, 28; ophthalmia neonatorum, 75. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the infectious hospitals of the London County Council on Nov. 8th was 3178, which included: Scarlet fever, 1184; diphtheria, 1247; measles, 59; whooping-cough, 231; puerperal fever, 20 mothers (plus 11 babies); encephalitis lethargica, 279; poliomyelitis, 10. At St. Margaret's Hospital there were 19 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 10 (0) from measles, 3 (1) from scarlet fever, 4 (2) from whooping-cough, 44 (6) from diphtheria, 56 (15) from diarrhœa and enteritis under two years, and 39 (5) from influenza. The figures in parentheses are those for London itself.

Diphtheria proved fatal in 5 cases at Liverpool, 3 at Sheffield and Birmingham, 2 at Dagenham, Ealing, West Ham, Portsmouth, Leeds, and Sunderland. Manchester reported 4 deaths from measles, Liverpool 2. Influenza is credited with 5 deaths at Manchester, 3 each at Sheffield and Birmingham, no more than 2 elsewhere.

The number of stillbirths notified during the week was 254 (corresponding to a rate of 41 per 1000 total births), including 31 in London.

CORRESPONDENCE

A FINAL APPEAL TO MEDICAL BENEVOLENCE

To the Editor of THE LANCET

SIR,—By your kindly permission I appealed to your readers in October for contributions towards our Christmas Gift Fund. I am very grateful to those who have already responded, but the amount received up to date is not sufficient to allow of Christmas gifts being given to more than a third of our beneficiaries.

The General Election is over, and Christmas is near at hand; may I therefore appeal once more in the hope that contributions will be forwarded to the hon. treasurer, Royal Medical Benevolent Fund, 11, Chandos-street, London, W. 1, lest any of our poor people be disappointed this year.

I ask all who have well-being in life to give as generously as possible and without delay, so that gifts may be distributed in time.

I am, Sir, yours faithfully,

THOS. BARLOW,
President of the Royal Medical Benevolent Fund.

Nov. 15th.

IMMUNISATION AGAINST DIPHTHERIA: ALUM PRECIPITATED TOXOID

To the Editor of THE LANCET

SIR,—In view of the increasing use of alum precipitated toxoid in connexion with diphtheria prophylaxis, it may be of interest to publish my own experience with this method during the course of the current year. The particulars are as follows:—

—		Manufacturer.			Total.
		A	B	C	
Schick-negative after	1 month	162	19	3	184
	2 months	11	—	—	11
	3 ,, ...	2	—	—	2
Total Schick-negative ..		175	19	3	197

Patients Schick-negative in 1 month .. 93 per cent.
,, ,, ,, ,, 3 months .. 100 ,, ,,

Cases treated with two doses of 0·1 c.cm. A.P.T. at 1 month interval (included above under "B").

9 cases Schick-negative 1 month after last injection.

(N.B.—No pre-Schick done but all were 1–3 years old and presumably positive.)

Most of the injections were given subcutaneously and the proportion of reactions varied from 3 to 5 per cent. with different batches. None were serious.

I am, Sir, yours faithfully,

A. T. POWELL,
Medical Officer of Health, Walthamstow.

Nov. 9th.

GASTROCOLIC FISTULA

To the Editor of THE LANCET

SIR,—Dr. Picton Davies, in his valuable article on Prognosis of Jejunal Ulcer published in your issue of Sept. 21st (p. 678), refers to three cases of gastrocolic fistula, all of whom died. My experience of this complication of jejunal ulcer leads me to believe that the prognosis is far less serious than these figures would indicate. We have had 7 cases of gastrocolic fistula among 90 of anastomotic ulcer in New Lodge Clinic since 1921. Of these 6 were operated upon by Sir Charles Gordon-Watson, the late Mr. R. P. Rowlands, Lord Moynihan, Sir Thomas Dunhill, Mr. Grey Turner, and Mr. Gaymer-Jones respectively, without a single death. In each case the stomach, jejunum, and colon were separated from each other, the original anatomy being restored. In 5 nothing more was done, but in 1 an anterior gastrojejunostomy was performed. One patient subsequently had a perforated duodenal ulcer, from which he recovered. In addition a man of 64, first seen in March, 1932, 28 years after a gastrojejunostomy had been performed for a duodenal ulcer, presented definite radiological signs of a gastrocolic fistula. The usual post-ulcer régime with occasional lavage of the stomach and colon has kept him free from symptoms ever since, the fistula being apparently valvular and only giving rise to occasional trouble.

In 1928 Mr. R. C. Brock (Guy's Hospital Reports, 1928, lxxviii., 178) reported 3 cases of gastrocolic fistula following jejunal ulceration which had been operated upon by Mr. Rowlands; these included one of the New Lodge Clinic cases. He referred in his paper to 5 other cases which he had found in the Guy's records; no deaths occurred among the eight. He has kindly searched the Guy's records since 1928 and finds that 4 more cases have undergone operation with 2 deaths. The combined New Lodge Clinic and Guy's Hospital records give 17 cases with 2 deaths, a mortality of only 12 per cent. These remarkable results are of course mainly due to the exceptional skill of the surgeons concerned, but an important factor in the low mortality has, I believe, been the preparation of the patient by thorough lavage of the stomach and colon for several days before the operation.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Nov. 6th.

THE INDEPENDENT MIDWIFE

To the Editor of THE LANCET.

SIR,—Your sympathetic leading article of Nov. 2nd, together with the valuable data contained in Lady Forber's Fynes-Clinton lecture, brings out very clearly the deplorable position of the private midwife. Most of those who have studied the question and read the report of the Joint Committee will concur in the view that a salaried service of whole-time midwives is likely to prove the only satisfactory way of escape from a most unhappy state of affairs. But, assuming the desirability of a service of competent midwives working under local authorities, voluntary associations, and hospitals, are there not certain questions which must be settled before it is possible to organise such a service on a national, or a compulsory, basis? For example, a successful whole-time service means in effect a limited and closed service, and therefore some control must be exercised over the number of new entrants to the profession.

The number of midwives now in practice is considerably in excess of those actually required, and in planning a midwifery scheme for any area it will not be easy to provide for the numerous midwives who, for various reasons, cannot be absorbed into the scheme. It would be unsatisfactory from the point of view of the local authority to compensate the midwives who were excluded, if newly qualified women could freely settle in the area as pin-money practitioners; neither would it be fair to continue to train many midwives who would have no chance of obtaining salaried posts. Therefore, the number of pupils, and consequently the number of training schools, would have to be reduced. If this is done,

how are the smaller maternity hospitals to be staffed, and who will make good the reduction of income from the loss of pupils' fees? Other matters which it seems desirable, if not essential, to settle concern the length and content of the training to be given to the new type of midwife who will gradually take over the work whole-time; what period it should cover; whether it should be based on general nursing or merely extend the midwifery experience; what provision should be made for the nurse who desires an additional qualification but does not wish to take up midwifery as a serious profession; how to reconcile the competing claims of the medical student and pupil-midwife for the use of clinical facilities.

There is also the question of improving and extending maternity nursing. Is it advisable to utilise the highly qualified midwife as economically as possible, and, following the example of Holland, train a body of registered maternity nurses to work for doctors and to assist the new midwives themselves?

These and other questions associated with the practice of midwifery are common knowledge; they have presumably remained unanswered because no single organisation has power and authority to deal with them. Obvious advantages will follow if the introduction of a salaried service of midwives makes it necessary not only to discuss them, but also to find a solution and remedy.

I am, Sir, yours faithfully,

Limpsfield, Nov. 11th. JANET M. CAMPBELL.

MEDICINE AND THE LAW

Medical Certificates by Deceased Practitioners

IN Simon *v.* Simon and others Mr. Justice Bucknill decided an interesting point on the evidential value of a medical certificate given by a doctor who had since died. A young woman obtained a medical certificate for a particular purpose in 1929; was it admissible in evidence for the purpose of refuting a charge against her relating to a time prior to the date of the certificate? Could it come within the rule of law which allows evidence to be given of declarations made by deceased persons in the ordinary course of their duty? Or did the usual rule against hearsay evidence govern the case and must the witness appear in open court and be cross-examined? The court decided that the certificate of the dead doctor was inadmissible. The law allows an exception where a deceased person had a duty to perform and had the duty also of recording that he had performed it. In the case under discussion the dead doctor had no duty to record the result of his examination of the young woman or to make any written statement of the result. He did undoubtedly give the certificate under his contract with the patient as any other professional man might give an opinion in the course of his practice. But this certificate was not within the exception allowed by law. Mr. Justice Bucknill thus followed Lord Merrivale's decision in Mills *v.* Mills (1920). There a charge of adultery was based on an allegation that the respondent contracted gonorrhœa in 1909 and that the petitioner was free from that disease, so that the husband could not have contracted it from his wife. Dr. N., a consulting physician who had treated the husband in 1908 and 1909, was dead. Dr. J., his successor in practice, was in possession of his case-books and notes. Dr. J. attended the court on subpœna to produce the case-book which was understood to contain the requisite information: he objected to produce the book unless ordered by the judge to do so. "I cannot see," said Lord Merrivale, "that any duty was cast upon the consulting physician to make these entries; he was practising alone and not in partnership; he did not make the entries in pursuance of any duty to the persons consulting him nor in pursuance of any statutory order or any binding rule of the profession." Not being made under any such duty, the entries were inadmissible.

Prosecution under Venereal Diseases Act, 1917

Proceedings against Robert Vivian Storer, initiated by the Director of Public Prosecutions under the Venereal Diseases Act, stand adjourned till Nov. 28th. The charges relate to treatment of patients, and advertisement of the offer to treat patients, by a person who is not a duly qualified medical practitioner. The defendant, it was stated, was brought before the General Medical Council last May on a matter of professional discipline and it was ordered that his name be erased from the Register. The present proceedings will be more fully discussed when the case is concluded.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. H. R. S. Hull to *Malabar* for R.N. Hospital, Bermuda.

Surg. Comdrs. T. N. D'Arcy to *Victory* for R.N. Hospital, Haslar, and J. H. B. Crosbie to *Victory* for R.N.B.

Surg. Lt.-Comdrs. H. A. Clarke to *Enterprise*, and W. P. E. McIntyre to *Drake* for R.N.B.

Surg. Lt.-Comdr. J. Hamilton to be Surg. Comdr.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. (D) H. P. Buchanan to be Surg. Lt.-Comdr. (D).

Surg. Lt. K. E. L. Yuill to *Vernon*.

D. R. Maitland entered as Proby.-Surg. Lt.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. C. J. Coppinger, O.B.E., having attained the age for retirement, is placed on ret. pay.

Maj. and Bt. Lt.-Col. E. A. P. Brock to be Lt.-Col.

Candidates granted short-service commissions as lieutenants on probation in the R.A.M.C.: S. J. Meyersohn, Univ. of the Witwatersrand; G. A. Weir, Glasgow Univ.; S. Brown, Edinburgh Univ.; W. N. L. Haynes and M. H. P. Sayers, St. Thomas's; W. N. J. Clarke, Queen's Univ., Belfast; J. F. Wilson, Edinburgh Univ.; P. J. Geoghegan, Univ. Coll., Cork; J. A. Dorran, R.C. of S., Ireland; J. R. Kellett, Trinity Coll., Dublin; J. D. Cruickshank, Birmingham Univ.; C. P. Stevens, Edinburgh Univ.; J. H. Caverhill, St. Thomas's; G. A. E. Harman, Glasgow Univ.; K. G. F. Mackenzie, St. Thomas's; J. A. Farfor, Edinburgh Univ.; H. N. Perkins, St. Mary's; P. B. Hanbury and D. P. Stevenson, Guy's; A. B. Dempsey, London Hospital; and T. D. M. Martin, St. Thomas's.

TERRITORIAL ARMY

Maj. F. W. Widgery receives pay and allces. of his rank.

W. Thomson (late Cadet Lce.-Corpl., Glasgow Univ. Contgt., Sen. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE

Flight Lt. G. M. Anderson is promoted to the rank of Squadron Leader.

Squadron Leader L. C. Palmer-Jones to R.A.F. Officers' Hospital, Uxbridge, for duty as Medical Officer.

Flight Lt. V. H. Tompkins to No. 28 (Army Coöperation) Squadron, Ambala, India.

Flight Lt. R. K. Muir relinquishes his short service commission on transfer to the I.M.S.

R. F. Courtin is granted a short service commission as a Flying Officer for three years on the active list and is seconded for duty at the Royal Victoria and West Hants Hospital, Bournemouth.

OBITUARY

WILLIAM GEORGE RICHARDSON, F.R.C.S. Eng.

THE death of Mr. W. G. Richardson at Keswick on Oct. 27th, at the age of 72, removes an old and valued surgical member of the Newcastle school. Although educated at the Leys School, Cambridge, and a student of St. Bartholomew's Hospital, Richardson was born in Gateshead and returned to Newcastle-on-Tyne when he had obtained useful surgical experience elsewhere, and remained on the staff of the Royal Victoria Infirmary until his retirement as consulting surgeon ten years ago. His health was never robust, but he was exceptionally gifted with his fingers and his surgical results were very good, especially in difficult bone cases. His study of the prostate gland gained him the Heath prize essay in 1904, and although he wrote no book many of his interesting abdominal and cerebral cases were set out in our own columns at the time. He was always a lover of country life and it was to gratify a deep instinct of his nature that on retirement he went to settle in the Lake district.

Dr. A. W. Wakefield, one of his Keswick friends, writes :—

"It is difficult to realise that never again shall we see the familiar figure of W. G. Richardson, in an old slouch hat, riding around the district on his bicycle. Never again shall we see him hard at work in his garden, which he loved so well, and which, largely by his own personal effort, he had transformed from a rough field to an exquisite flower garden and rockery. Never again shall we interrupt him in the act of making his scientifically hung huge drive gate, or working in his rock garden, to tell him that some urgent surgical case had just been admitted to the hospital and *would* he come and do it? So often, so very often, this happened. And the response was always the same—a groan, a cheery smile, and 'must he leave his garden and get his hands clean?' And almost before one could explain the urgency, he would be at the hospital preparing for the operation. He came to Keswick professedly 'to retire.' Yet I sometimes think that he must have had almost as many emergency operations here as he had before his 'retirement.' He was always ready to help, in any way at all, and most of this work was gratuitous. In fact he had the way of almost making it appear that one was doing him a favour in asking him for help. And on seeing the patient how kindly and sympathetic, how thoughtful and how thorough he was in his examination.

"But his activities were not confined to his garden and his surgery. He loved our Lakeland, he loved our hills, and he loved walking over them and exploring them. The view from the house which he built for himself at Portinscale is lasting evidence of his eye for natural beauty. And besides all this he threw himself whole-heartedly into the local activities and interests. He was a member of the rural district council, and besides being the life and soul of the Keswick and District Bee Keepers' Association, he took an active part in the local horticultural society, the Braithwaite debating society, and the Portinscale reading-room. Whatever he did was done with all his might—always happy, a cheerful smile for everyone, deeply lamented by everybody of every class and creed."

Mr. Richardson married Sarah, daughter of Dr. George Arnison of Allendale Town, who predeceased him. There were no children of the marriage.

THOMAS DUTTON, M.D. Durh., M.R.C.P. Edin.

Dr. DUTTON, who died in London on Monday at the age of 81 years, had lived a varied and strenuous life. Born in Pimlico and educated at Bayswater Grammar School and Guy's Hospital, he went on to Scottish universities, qualifying in Edinburgh in 1878 and taking the Durham M.D. four years later. He was then for several years in the mercantile marine, acting as surgeon on the *Elysia*, *Tongariro*, and *Argonaut*, and later admiralty surgeon and agent for the Chichester division. On his return to London he practised in Holland Park, being active in medical politics, and becoming a consulting physician with special interest in diseases of the digestive organs and in the eradication and care of tuberculosis. In his early days he had taken up yachting and swimming—he was an amateur champion—and his writings covered a large range of subjects on the practice of healthy living. He published a popular book on "Voyaging for Health," and a treatise on "Indigestion Clearly Explained," which ran into several editions, and a handbook on "The Food and Rearing of Children," which also was reprinted several times. Papers on diet, alcohol, hygiene, and tuberculosis appeared in our own columns. He remained in practice until his death, being honorary physician to a welfare clinic in Uxbridge-road. He was also vice-chairman of the Pure Food Society.

JOHN MONRO GIBSON, F.R.C.S. Eng., who died at the Hospital of St. Nicholas and St. Martin at Pyrford, Surrey, of broncho-pneumonia, was son of Dr. H. Wilkes Gibson, formerly in practice in South Hampstead. He was educated at Rugby School and University College, Oxford, where he was an honorary scholar of his college and won the Theodore Williams scholarship for anatomy. He went on to St. Thomas's Hospital from which he qualified in 1929, and held the post of surgical registrar there after residence at the Surrey County Hospital. He then accepted a commission in the R.A.M.C. which he was obliged to relinquish on account of ill-health and became resident medical officer at Pyrford, where he was able to carry on orthopædic work until a few days before his death at the age of 30 years.

Dr. GEORGE YOUNG, who died at Colchester on Oct. 30th after an operation, was ophthalmic surgeon to the Essex County Hospital and well known as a musician. He was educated at Zurich and Philadelphia, taking his Swiss degree in 1901 and qualifying in this country from the London Hospital in the following year. Turning to ophthalmology, after some experience in London, he went to New York where he became assistant surgeon to the Eye and Ear Infirmary, and ophthalmic surgeon to the Central and Neurological Hospital, taking the M.D. of New York State in 1908. For a time he lectured on physiological optics at Oxford University, and for the last 20 years was in charge of the department at Colchester, where he designed the new ophthalmic clinic opened ten years ago, which is one of the best things of its kind. Dr. Young was equally at home on the piano and violin, and he was able to accompany distinguished violinists like Albert Sammons to their entire satisfaction. In his spare time he used to make violins. He was only 60 years of age.

MEDICAL NEWS

Royal College of Surgeons of England

The annual meeting of fellows and members will be held at the College in Lincoln's Inn-fields, London, on Thursday, Nov. 21st. On behalf of the Society of Members of the College Dr. C. Luther Batteson will move, and Dr. Richard Gillbard will second, a resolution affirming that in the opinion of the meeting members should be represented on the council.

University of London

At meetings of the senate on Oct. 23rd Dr. W. D. Newcomb was appointed associate examiner in pathology at the M.B., B.S. examination in November, and Mr. C. B. Goulden, Mr. R. Foster Moore, and Prof. E. D. Telford examiners for ophthalmology in the M.S. examination in December. Dr. A. M. H. Gray was appointed a governor of the British Postgraduate Medical School, and Sir Ernest Graham-Little, Prof. H. R. Kenwood, and Sir Holburt Waring, members of the court of governors of the London School of Hygiene and Tropical Medicine.

On Dec. 2nd, 4th, and 5th at 5.30 P.M. at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., Major-General Sir John Megaw will lecture on neglected aspects of public health work with special reference to India.

University of Liverpool

The title of emeritus professor has been conferred on Mr. W. H. Gilmour who retired at the end of last session from the Louis Cohen chair of dental surgery.

University of Sheffield

Mr. T. B. Mouat, F.R.C.S., has been appointed lecturer in surgery to dental students, and Mr. Wilfred Hynes, F.R.C.S., has been appointed to the honorary demonstratorship in operative surgery which Mr. Mouat has resigned. The following external examiners have been appointed :—

Anatomy, Prof. D. M. Blair; physiology, Prof. H. S. Raper, F.R.S.; pharmacology, Prof. A. D. Macdonald; medicine, Dr. J. W. McNee; surgery, Prof. G. E. Gask; public health, Prof. J. Johnstone Jervis; forensic medicine, Prof. J. E. W. MacFall; dental subjects, Prof. T. Talmage Read, and (for Ph.D. thesis) Sir Norman Bennett.

Royal College of Physicians of Edinburgh

At a quarterly meeting of the college held on Nov. 5th, with Dr. Edwin Bramwell, the president, in the chair, Dr. Helen May Russell (Edinburgh) was introduced and took her seat as a fellow. Sir Harold Gengoult Smith (Melbourne, Australia) and Dr. Sidney Solomon Rosebery (Sydney, N.S.W.) were elected to the followship. The Hill Pattison-Struthers bursary in anatomy and physiology was awarded to John Tolland, and the Wood bursary to C. C. Gardner.

The college will shortly award a Kirk Duncanson fellowship for medical research, of which further particulars will be found in our advertisement columns.

Royal Free Hospital

The annual reunion dinner of the old students of the London School of Medicine for Women will be held on Thursday, Nov. 28th, at the Savoy Hotel at 7 for 7.30 P.M. Dr. Letitia Fairfield and Commander Stephen King-Hall will be among the guests.

Royal Society of Arts

At an ordinary meeting of this society to be held on Jan. 15th, 1936, at 8 P.M., Mr. L. H. Lampitt, D.Sc., will discuss Food and the World. On Feb. 10th, 17th, and 24th, at 8 P.M., Major-General Sir Robert McCarrison will give three Cantor lectures on Nutrition and the Nation. The address of the society is John-street, Adelphi, W.C.2.

Dental Clinics in Sweden

An official proposal is put forward for the establishment of dental clinics throughout Sweden, with the object of ensuring that everyone's teeth shall be under the care of the State from the age of three onwards. The country would be divided into 425 dental districts with a total of 575 district dentists, the yearly cost being estimated at over 7 million kroner (about £370,000), of which 4·65 million kroner would be borne by the State.

Infants Hospital

A course in infants' diseases for medical officers of welfare centres and others interested in nutritional disorders and dietetics will be given at the hospital, Vincent-square, S.W., from Nov. 25th to Dec. 6th.

Society of Medical Officers of Health

The annual dinner of this society will be held at the Piccadilly Hotel, London, on Friday, Nov. 22nd, at 7.30 P.M., with Dr. W. G. Savage, the president, in the chair. Sir George Newman will be the guest of honour, and Sir Kingsley Wood, Minister of Health, intends to be present.

British Health Resorts Association

The annual general meeting of this association will be held at the Institute of Hygiene, 28, Portland-place, London, W.1, at 4 P.M. on Thursday, Nov. 28th, with Lieut.-Colonel R. H. Elliot in the chair. The general secretary is Dr. Alfred Cox, and he may be addressed at 199, Piccadilly, W.1.

Royal Dental Hospital

The 26th annual clinical at home of this hospital will be held on Saturday, Nov. 23rd. During the morning there will be demonstrations at the hospital and at Charing Cross Hospital, while in the afternoon there will be exhibitions of clinical cases and specimens.

Glasgow University Club, London

The annual dinner of this club will be held at the Trocadero Restaurant, Piccadilly, W., on Friday, Dec. 6th, at 7.15 for 7.30 P.M., with Prof. J. Graham Kerr, F.R.S., in the chair. Any Glasgow University men who, though not members of the club, desire to attend, are asked to communicate with the hon. secretaries, 62, Harley House, N.W.1.

Research Scholarship in Tuberculosis

A Walton Marsh Barnes research scholarship on the biochemistry of tuberculosis, tenable in the pathological department of the City of London Hospital for Disease of the Heart and Lungs, Victoria Park, E., will shortly be awarded. The scholarship is of the value of £500 for the first year, and may be held for a further two years with annual increments. Applications should reach the secretary of the hospital by Nov. 29th.

Prize in Anæsthetics

The *British Journal of Anæsthesia* is offering a prize of ten pounds for the best essay on any subject concerned with the administration or physiology of anæsthetics submitted before August 1st. The essays should not exceed 4000 words in length and candidates must possess a medical qualification within the British Empire. Further particulars may be had from the editor of the journal at 19, St. Andrew's Mansions, Dorset-street, London, W.1.

St. George's Hospital, London

On Nov. 5th Miss Marie Tempest opened the new ward at this hospital for the use of the theatrical profession, which is the result of the matinée given at Drury-lane to celebrate her fifty years on the stage. The ward is to be called after her.

A cheque for £746 has been received from the management of Grosvenor House, Park-lane, which is the hospital's share of the gate-money of the Antique Dealers' Fair.

Ulster Medical Society

At the opening meeting of this society on Oct. 24th Dr. S. R. Hunter, on retiring from the chair, welcomed the newly elected president, Dr. Foster Coates, who gave an address on the importance of vitamins in dietetics. Referring to vitamin-D deficiency he pointed out that where there was much sunshine less vitamin was required in the diet; whereas in polar regions, where the sunlight was less intense and the body more completely clothed, the function of protection passed from the light to the diet. In Britain to-day the adaptation of diet to climate was incomplete. At the close of his address Prof. R. J. Johnstone and Sir Thomas Houston proposed and seconded a vote of thanks.

Warneford Hospital, Leamington

An anonymous donor has given £1000 for the endowment of two cots at this hospital. The fund for the new maternity block amounts at present to £4174.

Prince of Wales's Hospital Club

The annual dinner of the club of The Prince of Wales's General Hospital, Tottenham, will be held at the Trocadero Restaurant on Thursday, Nov. 28th, at 7.45 for 8 P.M., with Mr. Norman Fleming in the chair. The hon. secretary of the dinner is Mr. A. Lowndes Yates. 36, Harley-street W.1.

Lectures on Tropical Hygiene

A course of lectures and demonstrations on tropical hygiene will be given by Lieut.-Colonel H. B. Newham, Mr. H. H. Clay, and Sir Malcolm Watson from Dec. 2nd to 12th at 4 P.M. for men and women outside the medical profession who are proceeding to the tropics. Further information may be had from the organising secretary of the Ross Institute of Tropical Hygiene, London School of Hygiene and Tropical Medicine, Keppel-street, W.C.1.

International Congress of Physical Medicine

The sixth international congress of physical medicine will meet in London from May 12th to 16th. Lord Horder will preside over the British section and other officers will be: Sir Robert Stanton Woods (chairman of the executive committee), Sir Henry Gauvain (chairman of the general committee), Dr. Albert Eidinow (hon. secretary), and Dr. Alexander Cawadias (hon. assistant secretary). Further details may be had from Dr. Eidinow at 4, Upper Wimpole-street, London, W.1.

Medico-Chirurgical Society of Edinburgh

The following officers have been elected for the coming session: president, Dr. David Huskie; vice-presidents, Dr. John Orr and Mr. W. J. Stuart; councillors, Mr. Norman Dott, Dr. Rae Gilchrist, Mr. C. F. W. Illingworth, and Dr. C. W. Somerville; treasurer, Mr. Walter Carlow; secretaries, Mr. J. J. M. Shaw and Dr. T. R. R. Todd; and editor of *Transactions*, Dr. A. Fergus Hewat.

At a meeting to be held on Dec. 3th Sir Lancelot Barrington-Ward will address the society on the diagnosis and treatment of acute abdominal conditions in childhood.

Libraries in Hospitals

A meeting of the Guild of Hospital Librarians was held at St. Thomas's Hospital on Oct. 31st. Hospital libraries owe their origin to the war library started by Sir Hagberg Wright and Mrs. Gaskell in 1914 for the supply of books to the sick and wounded and the Red Cross is continuing the work. Dame Rachel Crowdy, vice-president of the guild, appealed for more books and more trained librarians. It is hoped to hold the second annual general meeting of the guild in Paris next year.

New Hospital at Hereford

The Herefordshire public assistance committee on Oct. 30th adopted a scheme for the erection at Hereford of a hospital which will provide wards for the sick to replace the accommodation at the poor-law institution, suitable maternity wards, accommodation for advanced cases of tuberculosis, and a new venereal clinic. The annual maintenance is estimated at £1200, and the scheme will cost in all £54,000.

Lectures on Child Health

A second series of ten weekly lectures has been arranged by the Jewish Health Organisation, and will be given at 8.30 P.M. on Saturdays at the Whitechapel Art Gallery, High-street, London, E., from Nov. 23rd to Jan. 25th. Dame Louise McIlroy will deliver the opening lecture on antenatal care, and other speakers will be: Dr. R. C. Jewesbury (care of the infant in the first two years of life), Dr. Bernard Myers (physical and mental welfare of the pre-school child), Dr. M. D. Eder (care of the child in relation to his studies), Dr. H. Harris (play in childhood), Mrs. Susan Isaacs, D.Sc. (mental welfare of the child), Mrs. Winifred Raphael (welfare of the worker), Prof. V. H. Mottram (domestic hygiene), Mr. Phineas Quass (protection of the worker), and Prof. Samson Wright (care of the adolescent). The lectures are open to all and no tickets are needed.

The Rogers Prize

An award of this prize will be made next year and candidates are invited to submit essays on the treatment of the sick poor of this country, and the preservation of the health of the poor in this country, or either of these subjects. Further particulars will be found in our advertisement columns.

Appointments

CARTER, HAROLD, M.B., F.R.C.S. Edin., M.C.O.G., has been appointed Medical Superintendent of the Central Middlesex County Hospital.

DENNY-BROWN, D. E., M.B. N.Z., M.R.C.P. Lond., Assistant Neurologist to St. Bartholomew's Hospital, London.

JONES, N. ROCYN, M.B. Camb., F.R.C.S. Edin., Assistant Orthopædic Surgeon to the Prince of Wales' Orthopædic Hospital, Cardiff.

LEWIS, EMLYNE, F.R.C.S. Eng., Resident Surgical Officer at the Hospital for Consumption, Brompton.

THOMAS, H. A., M.B. Liverp., D.P.H., Medical Officer of Health for the County of Denbigh.

Gordon Hospital, Vauxhall Bridge-road, S.W.—The following appointments are announced:—
HUDSON, MAURICE, M.B. Lond., Hon. Anæsthetist;
JOHNSON, E. F., M.B. Lond., Hon. Anæsthetist; and
MORRIS, L. H., M.R.C.S. Eng., Hon. Anæsthetist.

Certifying Surgeons under the Factory and Workshop Acts: Dr. A. MACKINTOSH (Sunderland District, Durham); Dr. F. WIGGLESWORTH (Howden District, County of York East Riding).

Births, Marriages, and Deaths

BIRTHS

ANDERSON.—On Nov. 5th, at Hornsey, the wife of Roy S. Anderson, M.R.C.S. Eng., of a son.

BARTLETT.—On Nov. 9th, at Saffron Walden, to Elsie, wife of Dr. Justinian Bartlett—a son.

BATCHELOR.—On Nov. 4th, at Putney Hospital, to Marjorie (née Rudkin), wife of J. S. Batchelor, F.R.C.S. Eng.—a daughter.

COPEMAN.—On Nov. 7th, at Devonshire-place, W., the wife of Dr. William S. C. Copeman, of Ferncroft-avenue, N.W., of a daughter.

FRANKLYN.—On Oct. 31st, at Bradford, the wife of Dr. Harold Franklyn, of a son.

GOLDEN.—On Nov. 4th, the wife of Gerald N. Golden, F.R.C.S. Eng., of Haslemere, Surrey, of a son.

SATCHWELL.—On Nov. 4th, at North Curry, Somerset, Bristol, the wife of R. E. Satchwell, M.B., of a son.

SINGER.—On Nov. 2nd, at Greenhithe, Kent, the wife of Major E. O. A. Singer, R.A.M.C., of a daughter.

WIGFIELD.—On Nov. 5th, at Buntingford, Herts, the wife of Alan Wigfield, M.B. Lond., of a son.

MARRIAGES

CARR—CHRISTOPHERSON.—On Nov. 8th, at the Parish Church, Reigate, Claude Morris Carr, M.B. Camb., of Reigate, to Audrey Lorna Clifford, second daughter of Mr. and Mrs. Dudley Clifford Christopherson, Reigate Hill.

LEECH-WILKINSON—KINGDON.—On Nov. 4th, at Chelsea Parish Church, Arthur Leech-Wilkinson, B.M. Oxon., F.R.C.S. Edin., 11, The Circus, Bath, to Joan Kingdon, younger daughter of the late Mr. F. W. Kingdon and Mrs. Kingdon.

THOMPSON—STENHOUSE.—On Nov. 2nd, at West Lulworth, Dorset, Geoffrey Thompson, M.D., to Ursula Stenhouse.

GOLDEN WEDDING

TAIT—GREENWAY.—On Nov. 12th, at St. Andrew's Church, Plymouth, by the Rev. Preb. Wilkinson, D.D., and the Rev. B. Liptrott, M.A., William Tait, M.B. Edin., R.N., H.M.S. *Cambridge*, youngest son of the late George Tait, of Kirknewton, Alnwick, to Emma, eldest daughter of John Greenway, of Shaftesbury Villas, Ford Park, Plymouth. Present address: Kirknewton, Alverstoke, Hants.

DEATHS

COATES.—On Nov. 1st, in London, after an operation, George Coates, D.M. Oxon., of South Kilworth, Rugby and Bordighera, Italy, aged 84.

CRESSY.—On Nov. 8th, at New Milton, Hants, Charles James Cressy, M.R.C.S. Eng.

LITHGOW.—On Nov. 7th, at Farnborough, Hants, Thomas George Lithgow, F.R.C.S. Edin., aged 82.

TEMPLETON.—On Nov. 2nd, at Bexhill-on-Sea, Percy Templeton, M.R.C.S. Eng.

WHITWELL.—On Nov. 3rd, at Church Stretton, George Graves Whitwell, M.B. Edin., late of Shrewsbury.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Nov. 19th.
General Meeting of Fellows. 5.30 P.M. Ballot for election to the fellowship.
Pathology. 8.15 P.M. (Group and Central Histological Laboratories at Archway Hospital (L.C.C.), Archway-road, N.). E. N. Allott: 1. Alkalosis in the Treatment of Gastric Ulcer. J. M. Alston: 2. Human Cases of Infection with an Organism resembling *B. necrophorus*. 3. Skin Reactions Produced by Pneumococcus Polysaccharide. W. G. Barnard and R. F. L. Hewlett: 4. Agranulocytosis. A. B. Bratton: 5. Anuria with Hæmoglobin Casts in Kidneys following Abortion. 6. Dissecting Aneurysms of Aorta at 14 and 32 years. 7. Carcinoid Tumour of Small Intestine Associated with Carcinoma of Colon. H. C. Brown and J. M. Alston: 8. Demonstration of Antibodies to *L. icterohæmorrhagiæ* in Human Serum. G. W. Goodhart and R. F. L. Hewlett: 9. Three Cases of Monocytic Leukæmia. 10. Case of Myeloblastic Leukæmia. 11. Case of Congenital Malaria. E. Hardy: 12. An Infection of Guinea-pigs due to *Bact. aertrycke*. L. F. Hewitt: 13. Electrode Potentials. J. E. McCartney: 14. Screw-capped Bottles for Culture Media. 15. Intravenous Solutions and a Simplified Method for their Administration. W. Mair: 16. Varieties of *C. diphtheriæ*. A. B. Rosher: 17. The Carrier Rate of Hæmophilic Bacteria in the Trachea of Post-mortem Subjects correlated with the Influenza Death-rate during the last seven years. 18. The Use of Chocolate-tellurite Medium for the Diagnosis of Diphtheria. A. B. Rosher and E. Hardy: 19. The Persistence of Agglutinins in the Blood of Inoculated Subjects in Relation to the Serological Diagnosis of Enteric. E. W. Todd: 20. Antistreptolysin Titrations.
THURSDAY.
Dermatology. 5 P.M. (Cases at 4 P.M.) Dr. H. W. Barber: 1. Schamberg's Progressive Pigmentary Dermatosis. 2. Pigmentation of the Leg Secondary to Varicose Veins. Dr. C. H. Whittle: 3. Schaumann's Disease. 4. Pemphigus Vulgaris. 5. Carcinomatosis of the Skin. Dr. Elizabeth Hunt: 6. Xanthoma Tuberosum Multiplex.
Neurology. 8.30 P.M. Prof. E. D. Adrian, F.R.S.: Electrical Activity of the Cortex. Mr. J. H. Quastel, D.Sc.: Enzymic Activity of the Brain.
FRIDAY.
Disease in Children. 5 P.M. (Cases at 4.30 P.M.) Dr. P. Evans (for Dr. W. Sheldon): 1. Portal Cirrhosis. 2. Biliary Cirrhosis. Dr. G. H. Newns: 3. Infantilism with Complete Hypospadias. Dr. R. Wilson (for Dr. D. Paterson): 4. Actinomycosis of the Lungs. Mr. R. M. Walker: 5. Total Pulmonectomy for Bronchiectasis. Dr. Maycock (for Dr. D. Paterson): 6. Late Rickets.

PADDINGTON MEDICAL SOCIETY.
FRIDAY, Nov. 22nd.—3.30 P.M., Visit to the Metropolitan Police Laboratory, Hendon.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.
FRIDAY, Nov. 22nd.—2.30 P.M. (11, Chandos-street, W.), Dr. C. P. Blacker: Discussion on the Report of the Departmental Committee on Sterilisation. Other speakers: Dr. D. Blair, Dr. W. A. Potts, Dr. P. K. McCowan, Dr. D. McRae, Dr. W. J. T. Kimber, and Dr. T. D. Power.

HUNTERIAN SOCIETY.
MONDAY, Nov. 18th.—9 P.M. (Cutlers' Hall, Warwick-lane, E.C.), The Bishop of St. Albans, Dr. C. P. Blacker, Dr. Halliday Sutherland, and Mr. E. R. T. Clarkson: That Birth Control is unnecessary in Modern Life.

EUGENICS SOCIETY.
TUESDAY, Nov. 19th.—5.15 P.M., rooms of the Linnean Society, Burlington House, Piccadilly, W., Mr. J. V. Quilliam, Mrs. C. B. S. Hodson, and Dr. C. P. Blacker: Voluntary Sterilisation—the Work of the last two years.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.
THURSDAY, Nov. 21st.—8.15 P.M., Dr. Eric de Verteuil and Prof. F. W. Urich: The Study and Control of Paralytic Rabies transmitted by Bats in Trinidad.

TUBERCULOSIS ASSOCIATION.
FRIDAY, Nov. 22nd.—5.15 P.M. (Manson House, 26, Portland-place, W.), Sir StClair Thomson: Tuberculosis of the Upper Respiratory Tract. Mr. R. E. Bickerton: Tuberculosis of the Eye. 8.30 P.M. Dr. E. L. Middleton and Dr. P. Heffernan: Industrialism and Tuberculosis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

VICTOR HORSLEY LECTURE.
TUESDAY, Nov. 19th.—5 P.M. (University College Hospital Medical School, Gower-street, W.C.), Sir Walter Langdon-Brown: Integration of the Endocrine System.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.
MONDAY, Nov. 18th, to SATURDAY, Nov. 23rd.—INFANTS HOSPITAL, Vincent-square, S.W. Mond., Wed., and Fri., 8 P.M. Course in anatomy and physiology for the F.R.C.S. (Primary).—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. All-day course in medicine, surgery, and gynæcology.—LONDON LOCK HOSPITAL, 91, Dean-street, W. Daily, 3 P.M. and 6 P.M., course in venereal disease.—Courses are open only to members of the fellowship.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
MONDAY, Nov. 18th, and TUESDAY.—2.30 P.M., Dr. David Nabarro: Diagnosis of Congenital Syphilis for School Medical Officers.
THURSDAY.—2 P.M., Dr. E. A. Cockayne: Fever of Obscure Origin. 3 P.M., Dr. W. W. Payne: Diabetes (IV.), Diabetes and the Ductless Glands.
Out-patient clinics daily at 10 A.M. and ward visits (except on Wednesdays) at 2 P.M.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Nov. 18th.—3.30 P.M., Dr. Symonds: Intracranial Pressure.
TUESDAY.—3.30 P.M., Dr. Critchley: Epilepsy and Allied Conditions.
WEDNESDAY.—3.30 P.M., Dr. Kinnier Wilson: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Walshe: The Motor System (II.).
FRIDAY.—3.30 P.M., Dr. Gordon Holmes: Disorders of Vision (I.).
Out-patient clinics daily at 2 P.M.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY, Nov. 20th.—4 P.M., Dr. H. Courtney Gage: Radiology of the Genito-urinary Tract.

KING'S COLLEGE HOSPITAL, Denmark Hill, S.E.
THURSDAY, Nov. 21st.—9 P.M., Mr. John Everidge: Genito-urinary Tuberculosis.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Nov. 20th.—4.30 P.M., Mr. Jocelyn Swan: Tumours of the Bladder.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Nov. 18th.—10 A.M., Medical wards and skin clinic. 11 A.M., Surgical wards. 2 P.M., Surgical and gynæcological wards, eye, and gynæcological clinics. 4.15 P.M., Mr. Green-Armytage: Sterility Investigation.
TUESDAY.—10 A.M., Medical wards. 11 A.M., Surgical wards. 2 P.M., Throat clinic.
WEDNESDAY, 10 A.M.—Children's ward and clinic. 11 A.M., Medical wards. 2 P.M., Eye clinic. 4.15 P.M., Dr. R. W. Ironside: General Anæsthesia.
THURSDAY.—10 A.M., Neurological and gynæcological clinics. Noon, Fracture clinic. 2 P.M., Eye and genito-urinary clinics.
FRIDAY.—10 A.M., Skin clinic. 2 P.M., Throat clinic. 4.15 P.M., Mr. Neil Sinclair: Surgery of Goitre.
SATURDAY.—10 A.M., Medical wards, children's and surgical clinics.
The lectures at 4.15 P.M. are open to all medical practitioners without fee. Operations, medical and surgical clinics daily at 2 P.M.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, S.W.
WEDNESDAY, Nov. 20th.—4 P.M., Dr. J. W. McNee: Differential Diagnosis of Jaundice.

INSTITUTE OF HYGIENE, 28, Portland-place, W.
WEDNESDAY, Nov. 20th.—3.30 P.M., Prof. John Eyre: Adolescence and Microbial Infections.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
TUESDAY, Nov. 19th.—5 P.M., Dr. W. N. Goldsmith: Infantile Eczema and Papular Urticaria.
WEDNESDAY.—5 P.M., Dr. I. Muende: Histopathology of New Growths of the Skin.

CHADWICK PUBLIC LECTURE.
TUESDAY, Nov. 19th.—5.30 P.M. (London School of Hygiene, Keppel-street, W.C.), Prof. R. C. McLean: The Bacteriology of the Atmosphere.

UNIVERSITY OF SHEFFIELD.
FRIDAY, Nov. 22nd.—3 P.M. (Royal Hospital), Mr. Vincent Townrow: Ear, Nose and Throat Clinic. 3 P.M. (Royal Infirmary), Dr. Rupert Hallam: Dermatology Clinic. Mr. A. B. Nutt: Ophthalmology Clinic.
SUNDAY.—10.30 A.M. (Royal Hospital), Prof. A. E. Naish: Medical Cases. 10.30 A.M. (Royal Infirmary), Dr. A. E. Barnes: Medical Cases. Mr. W. J. Lytle: Surgical Cases. 10.30 A.M. (Jessop Hospital), Mr. Glyn Davies: Gynæcological Cases.

GENERAL INFIRMARY, Leeds.
TUESDAY, Nov. 19th.—3.30 P.M., Mr. Chamberlain: Demonstration of Surgical Cases.

PUBLIC DISPENSARY, Leeds.
WEDNESDAY, Nov. 20th.—4 P.M., Dr. H. G. Garland: Headache—Common Causes and Treatment.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Nov. 21st.—4.15 P.M., Dr. A. Renshaw: Septicæmia.

MANCHESTER HOSPITAL FOR CONSUMPTION AND DISEASES OF THE EAR, NOSE, THROAT AND CHEST, Hardman-street, Manchester, 3.
WEDNESDAY, Nov. 20th.—4.30 P.M., Mr. E. S. Burt Hamilton: Deafness.

ROYAL INFIRMARY, Manchester.
TUESDAY, Nov. 19th.—4.15 P.M., Dr. William Brockbank: Heart Disease in Schoolboys.
FRIDAY, Nov. 22nd.—4.15 P.M., Mr. Harry Platt: Demonstration of Orthopædic Cases.

ST. MARY'S HOSPITALS, Manchester.
THURSDAY, Nov. 21st.—4.15 P.M. (Whitworth-street West Hospital), Dr. Ward: Paralysis of Childhood.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
WEDNESDAY, Nov. 20th.—4.15 P.M. (Southern General Hospital), Dr. W. R. Snodgrass: Cardiovascular Diseases.

NOTES, COMMENTS, AND ABSTRACTS

KWASHIORKOR

A NUTRITIONAL DISEASE OF CHILDREN ASSOCIATED WITH A MAIZE DIET

BY CICELY D. WILLIAMS, B.M. Oxon., M.R.C.P., D.T.M. & H. Lond.

THE name "kwashiorkor" indicates the disease the deposed baby gets when the next one is born, and is the local name in the Gold Coast for a nutritional disease of children, associated with a maize diet, which was first described in December, 1933.[1] An attempt is here made to compare the disease with other conditions, and to indicate the differential diagnosis.

Kwashiorkor is usually observed between the ages of six months and four years, the youngest case noted being nine weeks and the eldest five years old. Some sixty cases have been observed in three years among patients at the Children's Hospital, Accra, the mortality being about 90 per cent. The history always includes defective feeding. The mother is sick, old, and malnourished, or has become pregnant again while the patient is still very young; or the mother may have died, breast-feeding being supplied by an unsuitable foster-mother, very often a senile grandmother; for among these African women some mammary secretion may be present in a woman who has not had a child for 20 years. Supplementary feeds consist mainly of a gruel made from partially fermented white maize, called arkasa, or, for older children, a thick dough of the same called kenki or kon. The child at first appears to progress normally. After a variable interval it ceases to gain weight and becomes irritable. Some swelling of the hands and feet and face appears. This always passes off, both in the event of improvement and in the terminal stages of fatal cases. There may be attacks of diarrhœa; there may be photophobia; and there was sloughing of the cornea in two cases. The most obvious feature is the skin condition. Small, black, thickened, crumpled patches appear first about the knees and elbows, afterwards along the extensor surfaces and the buttocks. These are areas exposed to irritation and pressure. They have no relation to exposure to light, in contrast to the lesions of pellagra. The skin is soft and pliant, but tends to peel off, leaving a moist, raw surface. There is no "branny desquamation." Small sores at the corners of the eyes and mouth and about the vulva are usual. There may be a trace of albumin in the urine. Malaria, bronchitis, and worms are frequent complications; in uncomplicated cases there may be a slight irregular pyrexia. The blood count is little affected; there is no great anæmia and no leucocytosis. The W.R. is negative. Post mortem the only constant finding is an extreme fatty infiltration of the liver.

FIG. 1.—A half-caste child, aged 5, suffering from kwashiorkor, with sores at the corners of the mouth.

Cases seen very early react well and promptly to an improved diet, rich in accessory substances. Nestlé's sweetened condensed milk with cod-liver oil and malt seemed to be the most successful line of treatment. Unfortunately the condition is an insidious one, and once the dermatitis has set in there is not much hope of recovery. Butter, eggs, tomato, orange, liver, Marmite, yeast, Bemax, iron, and arsenic have also been tried in the treatment.

Figs. 1 and 2 show the condition in a half-caste child of five who died two months later. It is just possible to see the sores at the corners of the mouth. The dark thickened patches of skin are seen on the legs and buttocks. There are none in the areas typical of pellagra. The microphotographs are of the liver (Fig. 3) and of a section of skin (Fig. 4) from the same case. Some points in the differential diagnosis between kwashiorkor and pink disease, vitamin-A deficiency, pellagra, and vitamin-C deficiency are set out below.

FIG. 2. — Dark thickened patches of skin on the legs and buttocks of the same child.

DIFFERENTIAL DIAGNOSIS

Pink disease.—Characteristics common to pink disease and kwashiorkor, both of which occur in young children, are irritability, irregular pyrexia, and skin lesions. The latter reacts well to *early* treatment, whereas the former runs a prolonged course, unaffected by treatment. In kwashiorkor photophobia is seen only occasionally, skin lesions are distinct and typical, and desquamation is extensive, deep, and severe; whereas in pink disease photophobia is pronounced, skin lesions are different, and desquamation is slight.[2]

Vitamin-A deficiency.—Characteristics common to both kwashiorkor and vitamin-A deficiency are the lack of animal fats in the diet, the occurrence of skin lesions, attacks of enteritis, and improvement under cod-liver oil. Phrynoderma, Bitot's spots, night-blindness, and xerophthalmia, often described in connexion with vitamin-A deficiency, occur in other members of the same population, but have not been observed in kwashiorkor, nor does the liability to skin infections appear to be increased.[3–10]

Vitamin-A and -B deficiency of Sierra Leone has in common with kwashiorkor stomatitis, conjunctivitis, and skin lesions, but it occurs in adults; many cases show eversion of the eyelids, and the desquamation is relatively slight.[11 12]

Vitamin-B deficiencies.—The differential diagnosis from beri-beri, which also causes œdema and affects children and infants, is that beri-beri, unlike kwashiorkor, may lead to sudden death in infants; may be very acute in onset; causes polyneuritis; and produces no skin lesions.[13] Moreover beri-beri responds to treatment in hours instead of in weeks.

Vitamin-B_2 deficiency differs from kwashiorkor in that the diet leading to the condition contains

no milk or yeast, whereas the diet of the children described above usually includes milk, though its quality is probably defective; and arkasa and kenki do contain yeasts, which have not, however, yet been cultured or tested for biological value.[14 15]

Other deficiencies.—Kwashiorkor cannot be due to deficiency of vitamin C or vitamin D, because the victims show no evidence of either scurvy or rickets. No tests for mineral or protein deficiencies have yet been made.

Pellagra has in common with kwashiorkor the occurrence of œdema, sores at corners of mouth and

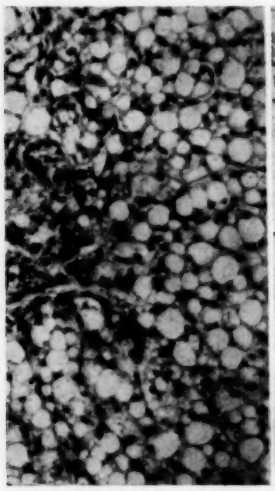


FIG. 3.—Photomicrograph of the liver showing extreme fatty infiltration.

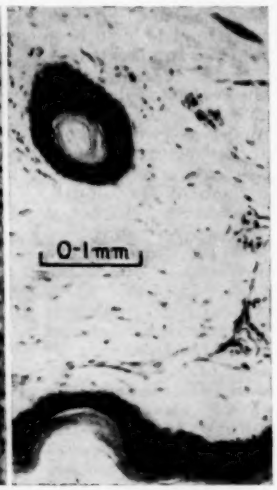


FIG. 4.—Photomicrograph of the skin.

eyes, skin lesions, irritability, and an association with maize diet and with diet poor in protein. The differences are set out below in tabular form.

Differences between Kwashiorkor and Pellagra

KWASHIORKOR	PELLAGRA [16–18]
Affected skin black, rugose, and soft.	Affected skin rough, dry, and branny.
Extensor surfaces and points of irritation and pressure affected.	Face, necklace area, and dorsum of hands and feet affected.
Skin not photosensitive.	Skin photosensitive.
Occurs in children under five years.	Rare in children.
Usual under two years.	Almost unknown under two years.
Reflexes unchanged.	Peripheral neuritis common.
Dementia not observed.	Dementia common.
Patients may be largely on a breast milk diet.	Very rare with milk diet.
Arkasa (preparation of maize) in diet contains yeasts.	Yeasts said to be curative.
Fatty infiltration of liver severe and constant.	Fatty infiltration of liver may be present, but is generally mild.
Never seen in adults.	Common in adults.
Common condition in the Gold Coast.	Never yet described in the Gold Coast.

It has been suggested that kwashiorkor is in fact pellagra,[20] but the points of difference appear to be more numerous and more striking than the points of similarity. The series of cases seen in East Africa by Dr. R. U. Gillan present apparently many points of resemblance to those described above[21] and a perfectly typical case of kwashiorkor has been described by Dr. Dyce Sharp in Cape Coast.[32]

I am indebted to the director of medical and sanitary services for permission to publish this article.

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(*Continued at foot of next column*)

SKELETAL REMAINS OF BISHOP JAMES KENNEDY

STRUCTURAL alterations at the University of St. Andrews in 1930 provided an opportunity for an almost complete anthropometric examination of the remains of Bishop James Kennedy, "the most eminent man in Scotland" in the first half of the fifteenth century. Kennedy was of royal descent, his mother being James I. of Scotland's elder sister, whose second husband was Sir James Kennedy. He took an active part in the development of St. Andrews University founded in A.D. 1411 under a Papal Bull, and was appointed one of the regents of the kingdom during the minority of James III. He was a great churchman and statesman, and was thought to have been the means of preserving the Stuart dynasty on the throne. In 1465 he was buried in St. Salvator's Chapel and when the tomb was opened in 1930 a massive casket of dark oak, engraved "Jacobi Kennedy" fell apart owing to dry rot, and the skeleton lay exposed. Prof. David Waterston was invited to examine the bones during the restoration of the tomb and describes his findings (Trans. Roy. Soc. Edin., 1935, lviii., 75).

No evidence of senile changes were seen in the skull or jaws. The limb bones indicate a man 5 ft. 8 in. in height, whose shoulders had been broad with powerfully developed muscles. The areas of attachment of the pronator quadratus on the left ulna was better developed than on the left, the difference being due to a special movement such as fencing. That he was probably a horseman is indicated by an excessive bone formation on the medial surface of the femora. An old oblique fracture is apparent in the right clavicle caused by indirect violence and sustained within the last few years of his life; there is an excess of callus but the fragments are in a position creditable to the surgeon of the day. For some years before his death he had suffered from chronic ill-health; the thoracic vertebræ are the seat of ossifying spondylitis, the sixth to the twelfth being fused together owing probably to some chronic pulmonary affection; there are also signs of a slight arthritis of the hip-joints.

The endocranial cast shows exceptional development of the areas of Broca and Wernicke, which are

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associated with the power of speech. The brain in general was large and highly developed and falls into the "brachycerebral" group. The form of the skull is distinctive, low and wide in the frontal region, and high and wide in the occipital. The face is long, cheek bones prominent, and the nose is high-bridged, these features being shown in drawings reproduced in Prof. Waterston's paper. In measurement and in general form the skull is characteristically Scottish.

RADIOPHOBIA

WHEN X rays were first discovered there was very natural enthusiasm for experiment on their application to diagnosis and treatment. Then came a period of growing caution inspired by accidents and unexpected sequelæ; and now again there are signs of a bolder outlook. But if our attitude is nowadays changing the change has by no means gone far enough for Dr. Foveau de Courmelles who inveighs against alarmist teaching (Jour. de méd. de Paris, 1935, xli., 889). He has the temerity to ascribe the whole scare to the non-medical radiographer who, he declares, came into the radiological department like a wolf into the fold and raised agitating cries about mysterious effects due to radiations from a distance. De Courmelles does not actually deny the damaging potentialities of rays directly encountered from near at hand, but he says that a very real and new disease—radiophobia—has been created by those who believe in influences felt yards away and through walls and ceilings. He suggests satirically that it is time we all started worrying about the effects of wireless rays, cosmic rays, and many other radiations which are now known to surround us from sun, earth, and stars. Certainly every alienist knows that the introduction of X rays has been a godsend to the deluded and paranoid patient who wants to explain abnormal sensations to his own satisfaction. Nevertheless, whatever de Courmelles may say, most radiologists will continue to feel that their specialty is no place for the foolhardy or careless worker.

CLANDESTINE DRUG TRAFFIC

RECENT meetings of the Council and the Assembly of the League of Nations have made it clear that, in spite of the complicated organisation which has been set up, there is no decrease in the amount of the illicit traffic derived from clandestine manufactories. This "very real menace to the world" it was resolved must be met by "an intensified international campaign." In the first place it was recognised that a universal application of the existing convention is indispensable to final success, and in the second place yet another convention is required which shall be directed to the suppression of illicit traffic. It is hoped that an international conference will be convened next year to consider a scheme, already in draft, which is intended "to coördinate the various forces, international and national, whose task it is to put an end to the illicit traffic." The lack of universality of international coöperation is shown by the fact that Soviet Russia, the Argentine, Paraguay, Sa'udi Arabia, and Ethiopia are not parties to any of the three Opium Conventions. The Limitation Convention of 1931 also lacks the adhesion of Albania, Denmark, Finland, Iceland, Latvia, Liechtenstein, Luxemburg, Yugoslavia, Bolivia, Liberia, and the Union of South Africa. In addition to the foregoing the Geneva Convention of 1925 has not been ratified by China, Iran, the United States, Guatemala, Haiti, Mexico, Nicaragua, Panama, Peru, and Afghanistan. Even some Governments which are parties to some of the conventions are lax in effectuating them or, as in the case of a majority of the Latin-American countries, fail to supply annual reports to the secretariat of the League.

In May, 1933, at its seventy-third session the Council of the League instructed the secretariat to communicate to governments, for a first consultation, draft articles prepared by the advisory committee as suitable for inclusion in an international convention. The replies which have been received were utilised for preparing an annotated draft for second consultation of the governments concerned. Out of 45 governments which have submitted observations 33 are in favour of the draft convention. The matter, after examination by a committee of experts, will again be brought before the Council.

There remains the not less important question, which has been for some years now before the advisory committee—namely, the limitation of production of raw opium and the coca leaf. It is now recognised that "clandestine manufacture depends on the liberal supply of raw materials" and that such limitation "if effectively applied would be a valuable step towards the final suppression of illicit traffic and drug addiction."

BRITISH AMBULANCE SERVICE IN ETHIOPIA

THE first unit of this service, consisting of four doctors, five orderlies, and transport personnel, will sail under the auspices of the British Red Cross Society next Saturday, Nov. 16th, by the *Sudan* and the *Rampura* for Berbera, where it will be joined by 24 trained African dressers recruited from Kenya and Uganda. This unit will proceed to the Ogaden war zone. Its members are Mr. John Melly, F.R.C.S. Edin. (principal medical officer), Dr. Arne Barkhuus, Dr. C. E. Bevan, and Dr. J. W. S. Macfie. A few days later the British Red Cross Society will send a small unit of two doctors and transport officers with medical stores via the Sudan to the northern war zone, which is at present entirely without medical aid. This second unit is being sent at the express request of the Emperor, and will be reinforced later. The appeals for funds for Red Cross help for Abyssinia have met with an immediate response, and the donations amount to about £22,000. But a total of at least £35,000 is needed and lack of money has prevented the equipment of the present unit with the X ray apparatus considered necessary. Further contributions, therefore, are urgently required, and they may be sent to Sir Arthur Stanley, British Red Cross Society, 14, Grosvenor-crescent, London, S.W.1.

GALL-STONE OBSTRUCTION IN THE INTESTINE

THE way in which an obstructing gall-stone has entered the lumen of the bowel must often remain doubtful, for it is usually considered wise to restrict exploration, and not to examine too carefully the gall-bladder and its surroundings. Rarely an opportunity arises of examining a case which throws light on the process of fistula-formation between biliary and intestinal tracts. In the October issue of the *British Journal of Surgery* Mr. C. P. G. Wakeley and Mr. F. W. Willway describe the findings of an autopsy in which a gall-stone measuring ¾ in. by ½ in.—i.e., of a size which they consider might cause intestinal obstruction—was on the point of ulcerating through from the common bile-duct to the duodenum. The stone was tightly impacted in the ampulla of Vater and the ulceration was beginning just above the opening on the papilla. Passage through the papilla itself of a stone large enough to cause intestinal obstruction would seem to be impossible, and it is probable that the most usual method of entry into the duodenum is through a fistula between the fundus of the gall-bladder and the duodenum. Wakeley and Willway point out that there is a good chance that such a fistulous opening does not close completely afterwards, and that it is therefore dangerous to perform cholecystectomy on a patient who has recovered from gall-stone obstruction of the intestine. They also think it important that the surgeon operating on a case of obstruction by gall-stone should be alert to the possibility of double obstruction. They have examined stones which have appeared to be on the point of breaking into two; they actually met

with a case of double obstruction, one stone being lodged in the rectum, and the other in the ileum. The two stones fitted neatly together. A facet on a stone removed should at once raise the question in the surgeon's mind as to whether another stone is present. The site of impaction seems to be fairly constantly in the ileum, most often in the lower ileum. Wakeley and Willway found the stone in the lower ileum in 7 cases, and in the middle ileum in 2 cases, while the site was in other parts of the intestine in four instances only. All their 11 patients (one with double obstruction) were operated on, with the low mortality figure of 3 deaths out of 11 cases. A correct preoperative diagnosis was made in 2 cases only. The possibility of dislodging the stone, and of shifting it either up or down to a healthier site for removal, is discussed. They found dislodgement possible in 6 cases; in 2 they were able to push the stone on, and in 4 they pushed it back. It was then possible to open the bowel at a part where healing could be confidently expected.

THE VICTIMS OF X RAYS

THE year 1935 is the fortieth anniversary of the discovery of X rays, and a notice in the November issue of the *British Journal of Radiology* states that it is proposed to publish in *Strahlentherapie* a memorial to all the X ray workers who have died as a result of devotion to their calling. Radiologists who have been personally associated with these men and women are asked to send brief accounts of their lives and deaths (about two type-written pages) and a photograph to the editor of *Strahlentherapie*, Prof. Hans Meyer, Parkallee 73, Bremen, Germany.

Vacancies

For further information refer to the advertisement columns

Albert Dock Hospital, Connaught-road, E.—Res. M.O. At rate of £110.
Apothecaries' Hall, Water-lane, E.C.—Rogers Prize. £200.
Assam, India, Welsh Presbyterian Mission Hospital, Shillong.—Surgeon.
Aylesbury, Royal Buckinghamshire County Hospital.—Hon. Cons. Surgeon to Ophth. Dept.
Bethnal Green Hospital, Cambridge-road, E.—Asst. M.O. £250.
Birmingham Maternity Hospital.—Hon. Obstet. Surgeon.
Birmingham, Queen's Hospital.—Res. Surg. O. £150.
Bolton Royal Infirmary.—Asst. Pathologist. £600. H.P. £200. Also H.S. £125.
Bradford, Grassington Sanatorium.—Asst. Res. M.O. £175.
Brentwood, Essex, High Wood Hospital for Children.—Asst. M.O. £250. Also H.P. At rate of £120.
Brighton Education Committee.—Asst. School M.O. and Asst. M.O.H. £500.
Brighton, Royal Sussex County Hospital.—H.S. Also Cas. H.S. £150 and £120 respectively.
Bristol General Hospital.—Sen. Res. M.O. £200.
British Postgraduate Medical School, Ducane-road, W.—H.S. (Obstetrics).
Buxton Clinic for Rheumatism and Allied Diseases.—H.P. At rate of £150.
Cancer Hospital, Fulham-road, S.W.—Res. M.O. £200. Med. Reg. £150. Also H.S. At rate of £100.
Carshalton, Surrey, Queen Mary's Hospital for Children.—H.P. At rate of £120.
Chelsea Hospital for Women, Arthur-street, S.W.—Jun. H.S. At rate of £100.
Chester Royal Infirmary.—H.S. £150.
Dreadnought Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £110.
Dublin, Mercer's Hospital.—Hon. Visiting Surgeon.
Durham County Hospital.—H.S. At rate of £150.
East Ham Memorial Hospital, Shrewsbury-road, E.—H.S. to Special Depts. and Cas. O. At rate of £120.
East Sussex County Council.—M.O. for Cuckfield Institution. £200. Also District M.O. for Cuckfield District. £120.
Edinburgh, Royal College of Physicians.—Kirk Duncanson Fellowship for Med. Research. £300.
Egyptian Government.—Principal M.O.H. of Cairo. L.E. 840–984. Also Director, Serum and Vaccine Institute, Cairo. L.E. 840–984.
Evelina Hospital for Sick Children, Southwark, S.E.—Anæsthetist to Aural and Dental Depts. 50 guineas.
Golden-square Throat, Nose, and Ear Hospital, W.—H.S. £100.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Halifax General Hospital.—Jun. Res. M.O. £250.
Highgate Hospital, Dartmouth Park Hill, N.—Asst. M.O. £250.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. for Country Branch. At rate of £250. Res. Anæsthetic Registrar. At rate of £150. Also Clin. Asst. M.O. 1 guinea per visit.
Hospital for Women, Soho-square, W.—Res. M.O. At rate of £100.
Huddersfield, St. Luke's Hospital.—Res. M.O. £200.
Ilford, King George Hospital.—Two H.P.'s and three H.S.'s. Each at rate of £100.
Indian Medical Service.—Commissions.
Jersey General Hospital and Poor Law Infirmary.—Radiologist. £500.
Jewish Maternity Hospital, Underwood-street, E.—Res. M.O. At rate of £50.
Kirbymoorside, Yorkshire Children's Orthopædic Hospital.—H.S. At rate of £150.
Leyton Borough.—Part-time Orthoptic Worker. 7*s.* 6*d.* per session.
Liverpool Hospital for Consumption and Diseases of Chest, Mount Pleasant.—Hon. Asst. Physician.
Liverpool, Stanley Hospital.—H.S. At rate of £100.
L.C.C.—Asst. M.O.'s for Mental Hospital Service. Each £470.
London University.—Rogers Prize 1936. £100.
Manchester, Ancoats Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £100.
Manchester, Baguley Sanatorium.—Jun. Asst. M.O. £250.
Manchester, Crumpsall and Withington Hospital.—Res. Obstetric Officers. Each at rate of £250.
Manchester Northern Hospital, Cheetham Hill-road.—Res. M.O. £150.
Middlesex County Council.—Visiting Dental Surgeon. £2 2*s.* per session.
Middlesex Hospital, W.—M.O. for Dept. of Radio-Therapy. £1200.
Mile End Hospital, Bancroft-road, E.—Asst. M.O. £350.
Miller General Hospital, Greenwich-road, S.E.—Cas. O. At rate of £150. Also H.P. and H.S. Each at rate of £100.
Newark General Hospital.—Res. H.S. £175.
Newport, Royal Gwent Hospital.—Asst. Cas. O. At rate of £135.
Norwood Hospital for Children, Elder-road, S.E.—Asst. M.O. £250.
Nottingham Children's Hospital.—Res. H.P. At rate of £150.
Nottingham City Hospital.—Res. Surg. O. £350. Also two H.S.'s. Each at rate of £150.
Oswestry, Robert Jones and Agnes Hunt Orthopædic Hospital.—Res. Surg. O. £350.
Plymouth, Prince of Wales's Hospital, Greenbank-road.—H.S. At rate of £120.
Poplar Hospital for Accidents, East India Dock-road, E.—Second Res. O. £175.
Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. At rate of £150.
Princess Elizabeth of York Hospital for Children, Shadwell, E.—Res. M.O. £200. H.S. Also Cas. O. Each at rate of £125.
Princess Louise Kensington Hospital for Children, St. Quintin-avenue, W.—Clin. Asst. for Out-patients.
Queen Mary's Hospital for the East End, Stratford.—Res. M.O. and 2 Cas. and Out-patient Officers. Each at rate of £150. Also 2 H.S.'s, H.P., Obstet. H.S., also Res. Anæsthetist and H.P. Each at rate of £120.
Rochester, St. Bartholomew's Hospital.—Res. Surg. O. At rate of £225.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100. Also Hon. Clin. Asst.
St. Charles' Hospital, St. Charles'-square, W.—Asst. M.O. £250.
St. George-in-the-East Hospital, Raine-street, E.—Asst. M.O. £250.
St. Olave's Hospital, Lower-road, Rotherhithe, S.E.—Asst. M.O. £250.
Salford, Infectious Diseases Hospital.—Jun. Asst. Res. M.O. £200.
Salisbury General Infirmary.—Res. M.O. £250.
Salvation Army, Mothers' Hospital, Lower Clapton-road, E.—Sen. Res. M.O. £150. Also Jun. Res. M.O. At rate of £80.
Sheffield Royal Hospital.—Clin. Asst. to Ophth. Dept. £300.
Southampton, Royal South Hants and Southampton Hospital.—Cas. O. Also H.S. to E.N.T. Dept. and Res. Anæsthetist. Each at rate of £150.
South London Hospital for Women, Clapham Common, S.W.—H.P. and two H.S.'s. Each at rate of £100. Also Anæsthetist. 10*s.* 6*d.* per attendance.
Stafford, Standon Hall Orthopædic Hospital.—H.S. £200.
Swansea General and Eye Hospital.—Res. Anæsthetist. £150.
Talgarth, Breconshire Mid-Wales Counties Mental Hospital.—Asst. M.O. £400.
Watford and District Peace Memorial Hospital.—H.S. and H.P. Each £150.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Jun. Res. H.S. At rate of £100.
West London Hospital, Hammersmith-road, W.—Physician to X Ray (Therapeutic) and Electrical Depts.
Winchester, Royal Hampshire County Hospital.—H.S. At rate of £125.
Wokingham, Berks, Pinewood Sanatorium.—Asst. M.O. £250.
York County Hospital.—H.P. £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Biggleswade (Bedford) and Rochford (Essex).

NEW MATERNITY CLINIC AT DEPTFORD.—The foundation-stone of a new maternity clinic at Deptford, which it is hoped will centralise six of the eight existing clinics, has been laid by the mayor. The building will be in two blocks, with a sun balcony, a gymnasium for massage and remedial exercises, and a toddlers' playground.